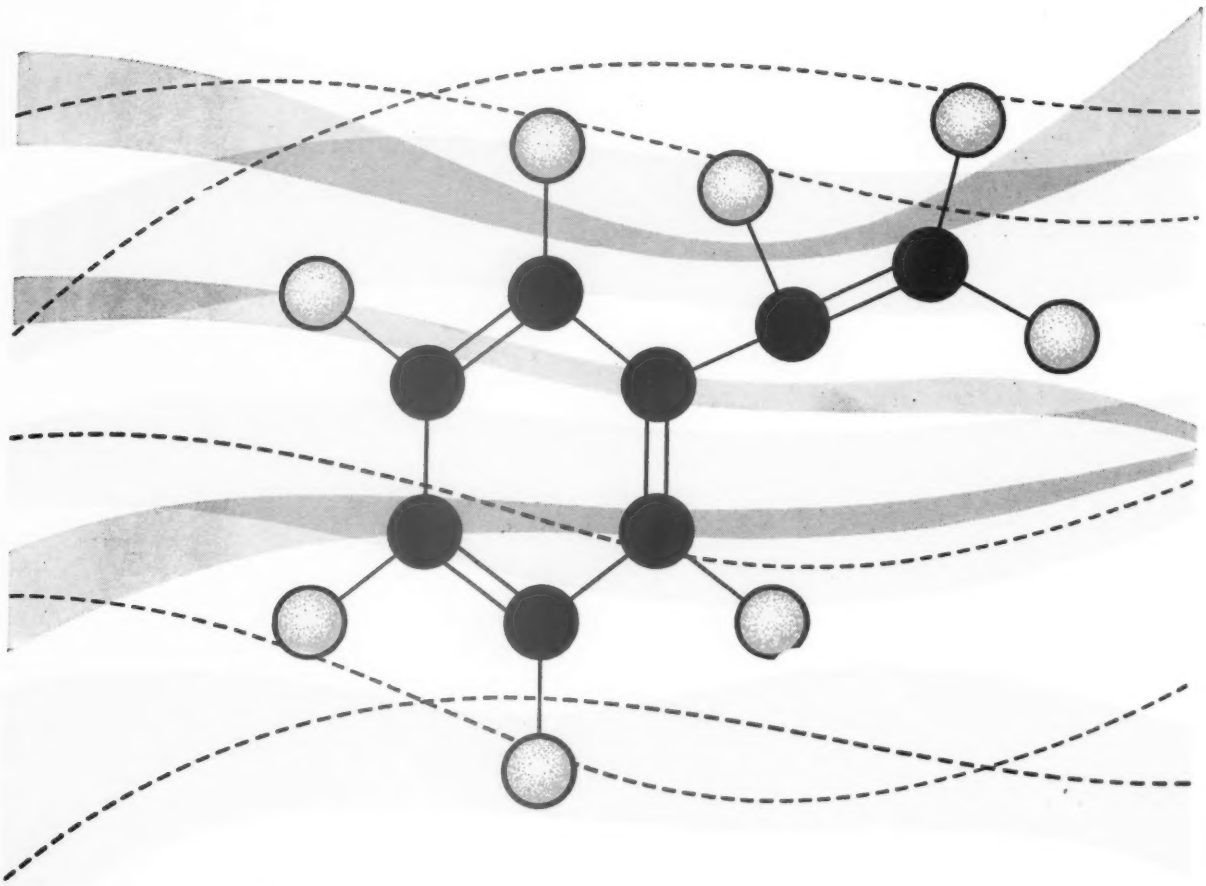
PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

SEPTEMBER
1956

STYRENE



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PAINT and VARNISH Production

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Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 46 SEPTEMBER, 1956 NO. 10

NEXT ISSUE

In connection with the Annual Federation Meeting scheduled in Cincinnati next month, the October (Convention) number of Paint and Varnish Production will feature an informative article on "Statistical Methods in the Coatings Industry."

Also included in this convention number will be a complete program of 34th Annual Meeting of the Federation together with a list of exhibitors at the Paint Industries' Show.

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Editorial Comment

September, 1956

About Our Convention Issue

IN connection with the forthcoming annual meeting of the Federation of Paint and Varnish Production Clubs and the Paint Industries' Show scheduled October 22-24th in Cincinnati, PAINT AND VARNISH PRODUCTION takes pride in announcing that its special convention number will feature a comprehensive and interesting article entitled, "Statistical Methods in the Coatings Industry."

Designed to meet the needs of paint technologists, this feature will cover, in a simple manner, the use of statistical techniques for the evaluation of data, for making decisions, and for designing experiments in three important areas: —research and development, quality control, and production.

Several case histories showing how statistics are being currently applied in the paint industry and how they can effect savings in both time and money for the ordinary paint plant will be presented in detail.

In the field of paint research, statistical techniques have much to offer, especially in control testing. Chemists involved in such work are constantly making measurements of such important properties as fineness of grind, weight per gallon, drying time, etc. Frequently, they make measurements in duplicate or triplicate in order that they might obtain reproducibility of results. Since many factors, both known and unknown, influence the test, the reproducibility and accuracy of results are affected. As an example, if an operator gets different results when he checks the hiding power of a paint. What or who is to blame? Is it the test method, the operator, the instrument used—or is it a combination of all these variables? Will the operator get the same set of results tomorrow or next month? Will a different operator get the same results working under the same conditions?

Problems of this type are constantly coming up in quality control and specification work. What many do not realize is that in statistical techniques we have the tools and power to design our tests and methods, analyze our test results, correlate our findings and predict precision and specification compliance.

In view of the contribution that applied statistics can make in coatings technology, we urge you to read this most important feature in our October Convention issue. Lord Kelvin once said—

"When you cannot measure what you are speaking about, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thought advanced to the stage of science, whatever the matter may be."

Edward R. Drake

WITH deep regret we report the death of Edward R. Drake. He was editor of PAINT AND VARNISH PRODUCTION MANAGER from 1935-1950 when it was acquired by its present publisher and the name changed to PAINT AND VARNISH PRODUCTION.

Ed Drake was well known in paint circles having headed the Wholesale Division of the National Paint, Varnish and Lacquer Association from 1933-1947.

He began his paint career as an office boy in the purchasing department of Whittier, Fuller & Co. This became the W. P. Fuller & Company in 1891, and in 1893 he became purchasing agent, resigning to become manager of the American Paint Works in New Orleans.

In 1902 he was employed by Peaslee-Gaulbert Company, Louisville to organize its paint department and later became its sales manager.

Ed Drake was founder of the Fifty Year Club of the National Association and was one of its oldest members.

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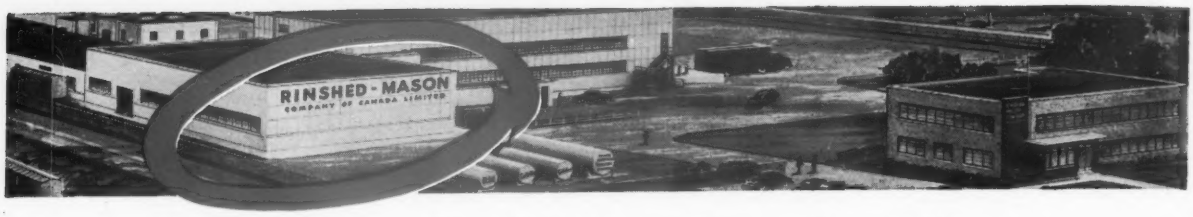

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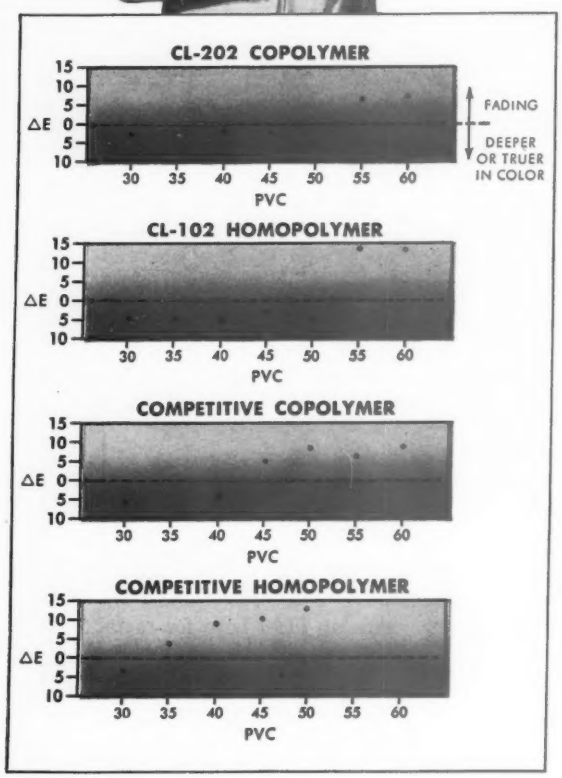

EXTERIOR DURABILITY. The above diagram illustrates the variations in tint retention obtained on identical paints formulated with fine vs. coarser particle size emulsions. These test paints, ranging in PVC from 30-60%, were made from a master pigment paste dispersion and let back with the test emulsions. The finished paints were tinted to a medium blue with an aqueous phthalocyanine blue dispersion and applied over asbestos cement panels. After Weatherometer exposure, the tri-stimulus value ΔE was plotted for each PVC. The value ΔE is the closest numerical representation of the color change apparent to the eye.

A study of the charts shows that *fine particle size* emulsions can be formulated at higher PVC's without sacrificing tint retention. The Critical PVC of both Celanese PVAc emulsions was greater than 50% *. . . higher than any emulsion tested!*

Fine particle size is the key to the superior tint retention of exterior polyvinyl acetate paints based on Celanese Homopolymer and Copolymer emulsions!

These facts were borne out in Weatherometer Tests on exterior PVAc paints ranging in PVC from 30-60%. All paints were identical in formulation except for the emulsion used.

Fading at low PVC's occurred in those paints formulated with ordinary *coarser particle size* emulsions after as little as 600 hours Weatherometer exposure. These same paints formulated with Celanese *uniformly fine particle size* emulsions showed *no evidence of fading* at PVC's up to 50%.

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- **Can be formulated at PVC's approaching those of alkyd flats**
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- **Tough, flexible, weather-resistant films**
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WRITE FOR TECHNICAL BULLETIN I-12

This 8-page bulletin gives complete physical and chemical properties; principal reactions of the carboxyl and alpha methylene groups; solubility curve, suggested uses and literature references. Working samples and quotation on request.

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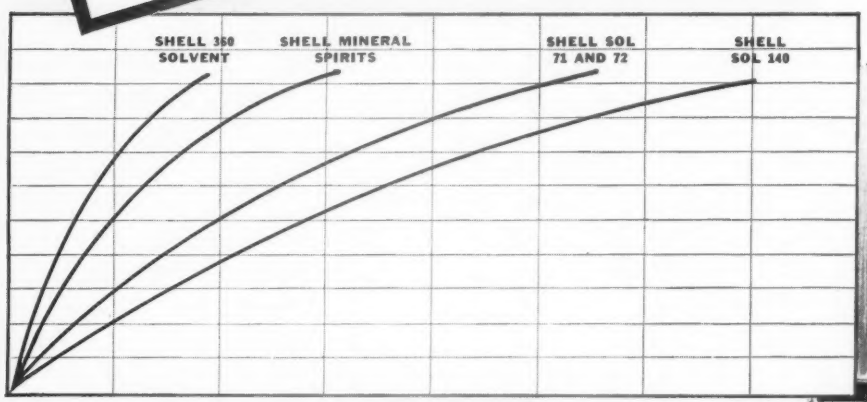

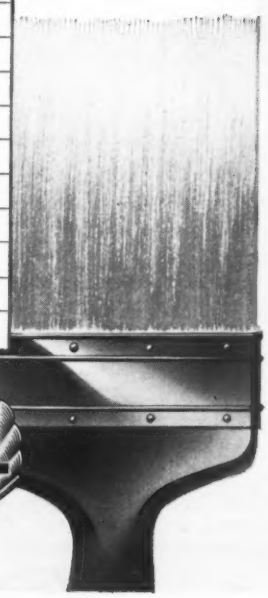

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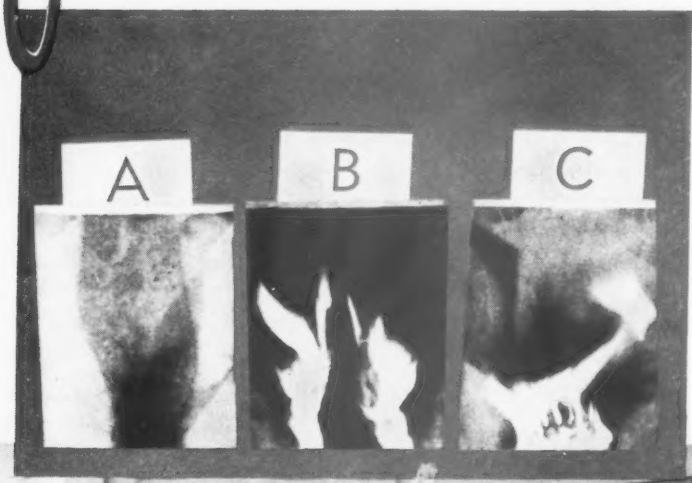
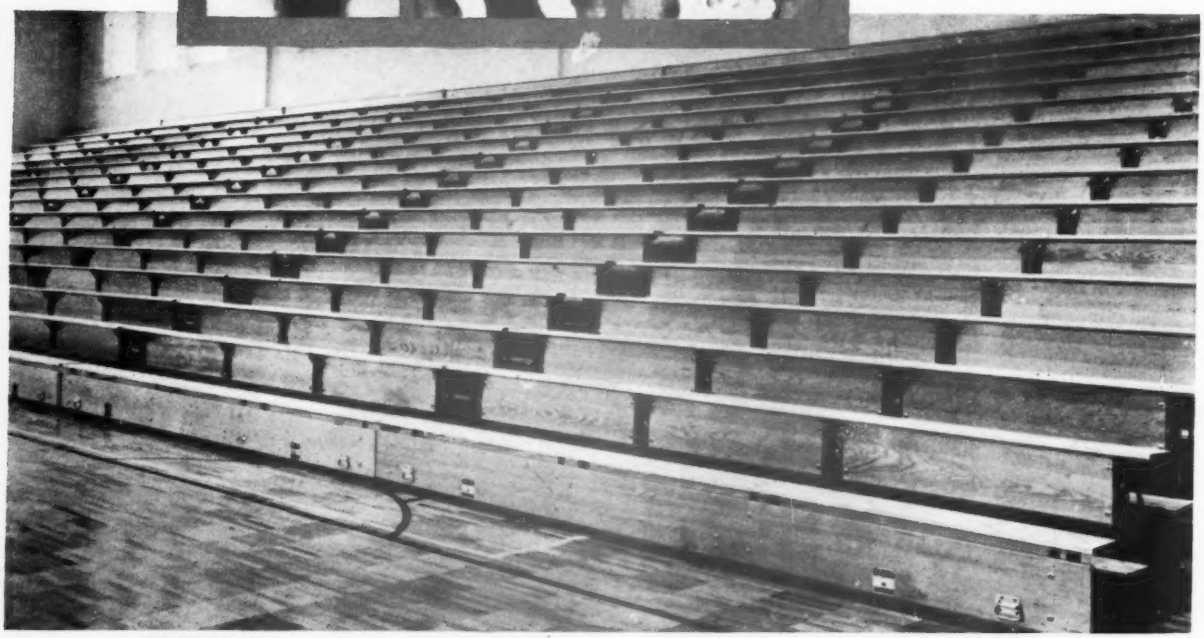
the flame test shows how



FLAME RETARDANCY TEST

3 lacquers were formulated using same basic formula with exception of plasticizer. In Case A, it was Celluflex CEF; Case B, tricresyl phosphate; Case C, dibutyl phthalate.

Lacquers were sprayed on panels, then ignited for 7 seconds. Upon removal of flame, Panels B and C continued to burn but Panel A (Celluflex CEF lacquer) extinguished itself within 2 seconds!



GYMNASIUM BLEACHERS finished with Armstrong Fire-Resistant Lacquer to prevent the spread of fire. With this clear lacquer, all types of public facilities can be made fire-resistant: auditorium seats, assembly hall chairs, school desks, church pews. It can also be used on furniture, kitchen cabinets, plywood and wood paneling and convention hall booths.

Photo courtesy of the Universal Bleacher Co. of Champaign, Ill.

Ramond J. Otten, Lacquer Research Director, Armstrong Paint and Varnish Works, Chicago, Illinois

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Celluflex CEF

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builds fire-resistance into new Armstrong lacquer

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Armstrong developed this new lacquer by utilizing Celluflex CEF as both plasticizer and flame retardant. Applied to wooden surfaces, it does not support combustion . . . merely chars in the presence of a flame. Once the source of fire is removed, the lacquer extinguishes itself.

Public facilities (like the gym bleachers shown), office and institutional furnishings—or any wood surface—can be made resistant to spread of fire. Celluflex CEF obviates the need for metallic flame retardants. The lacquer retains all of its beauty, clarity and durability.

Celluflex CEF is being used by manufacturers of a wide variety of plastics and surface coatings—cellulosics, vinyls, polyesters, polyurethanes.

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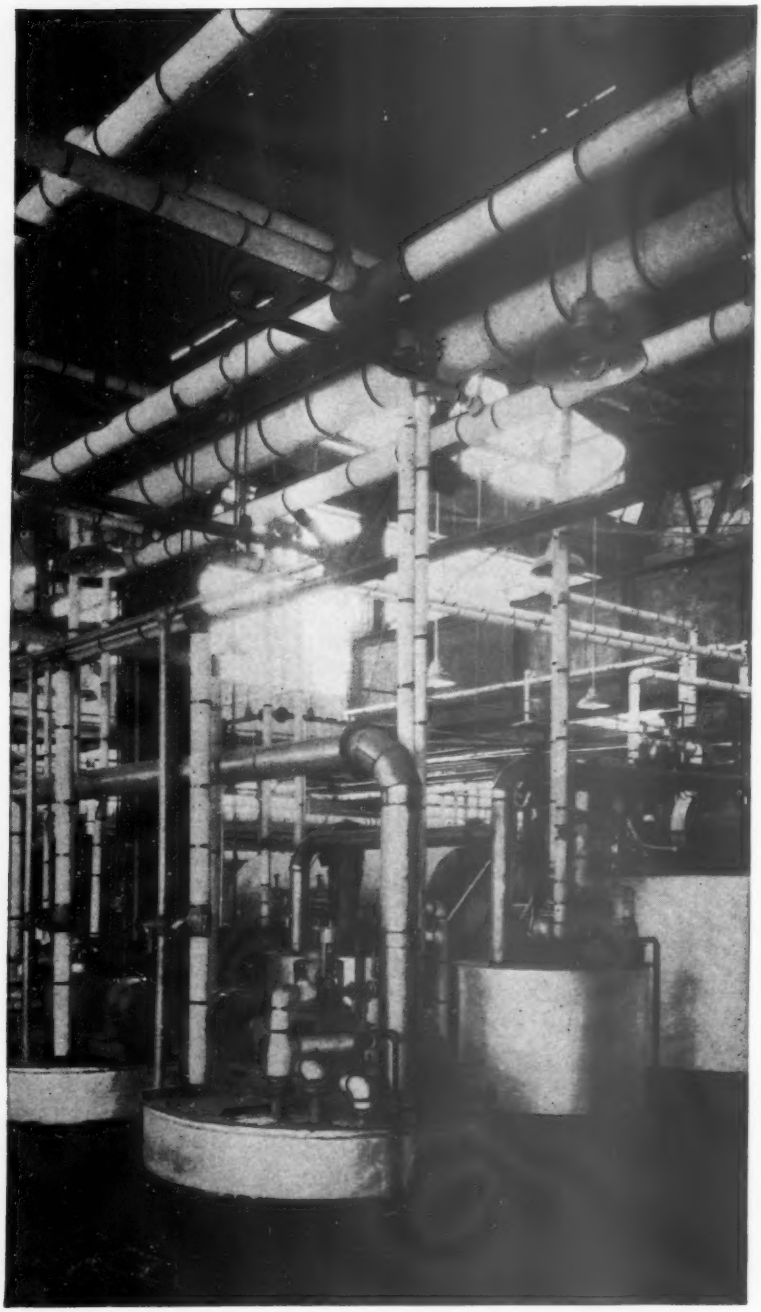

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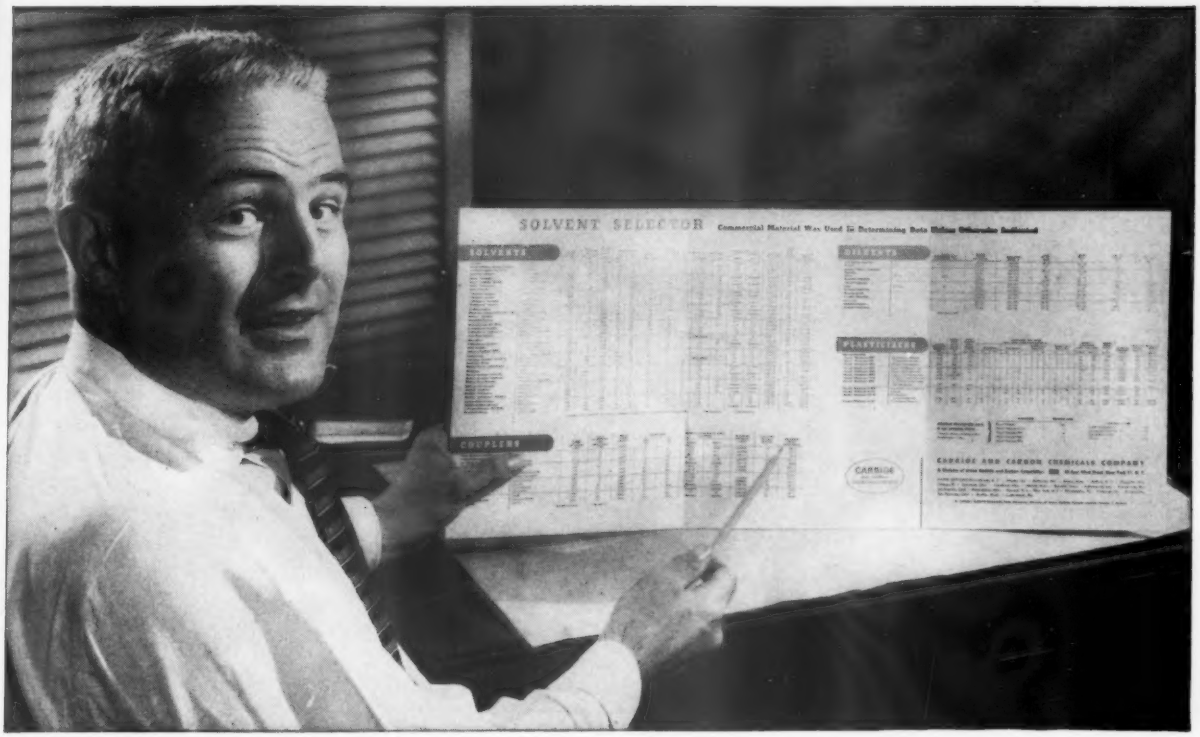

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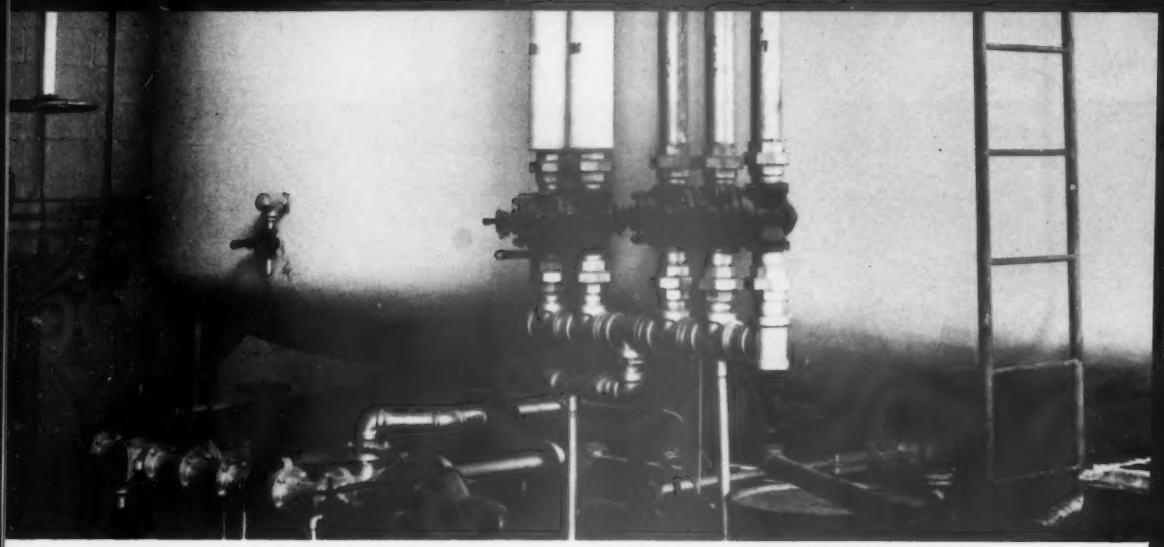

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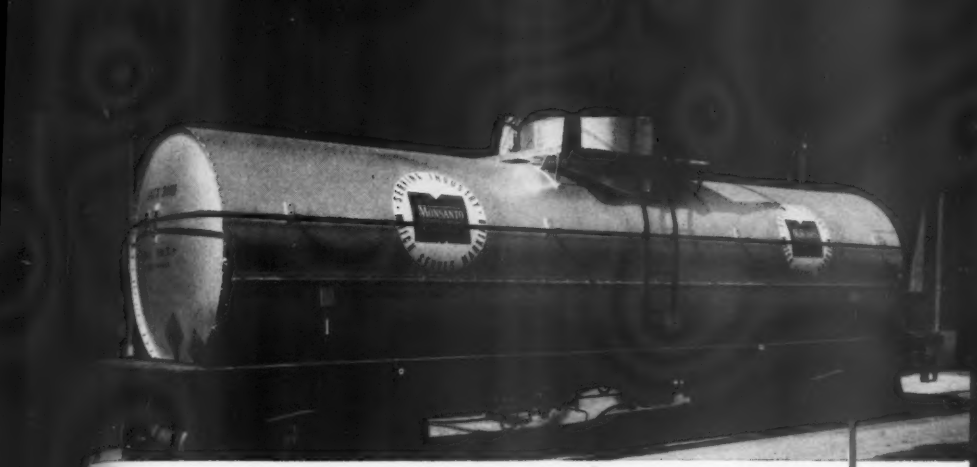

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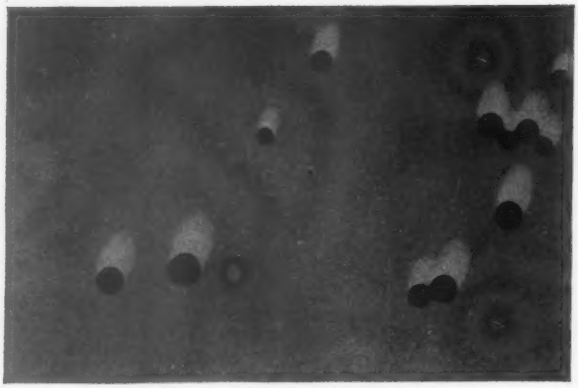

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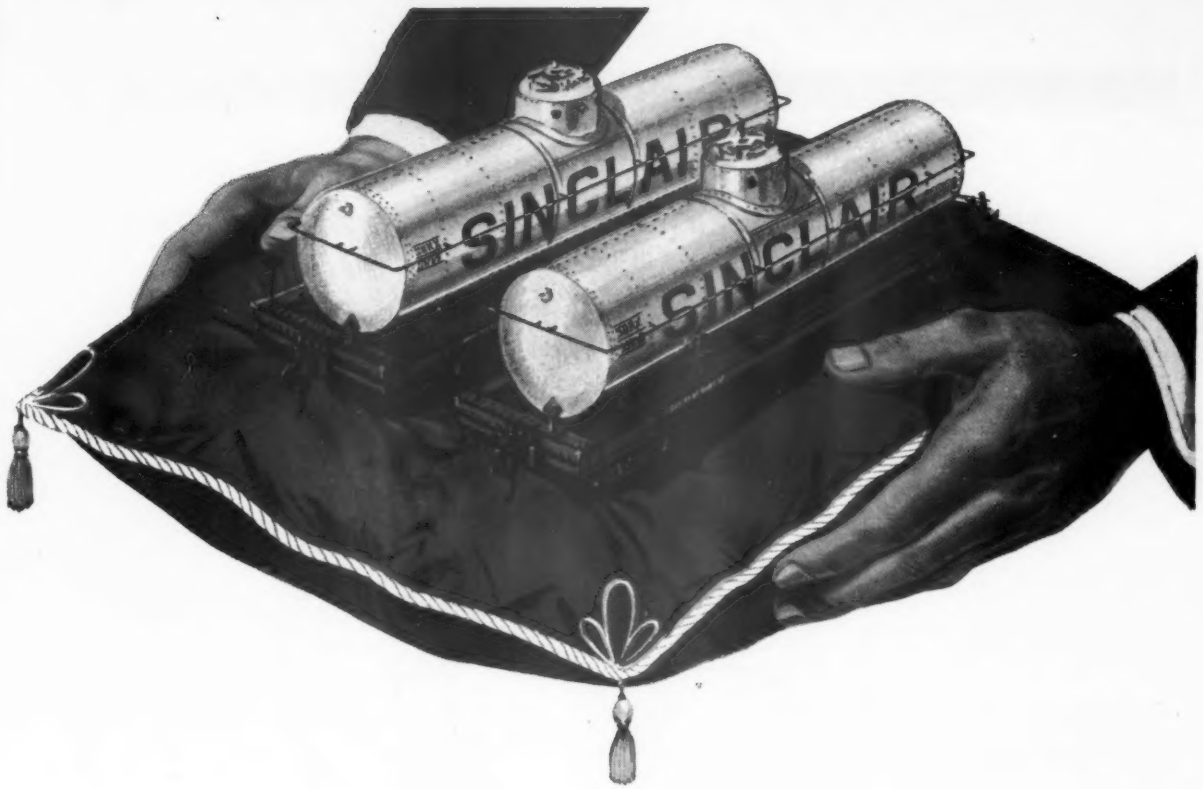

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SHAWINIGAN RESINS

PROBLEMS IN THE FINISHING OF AUTOMOBILES

Article discusses problems arising from surface contamination, undercoats, and new finishes

By
Ralph J. Wirshing
and
Wardley D. McMaster*

When faced with new problems, we sometimes say: "the price of progress is trouble". Since we live in an age of unusual developments there seems to be no limit to the number of challenging problems in any field of endeavor. Three problems are presented for your interest.

Problem of Surface Contamination

PHOSPHATE treatment of steel on an industry-wide basis is a little more than 20 years old, fifteen if we discount the war years. Nearly ten years passed before production people solved the various mechanical and control problems sufficiently well for any variables to appear and be recognized for what they were. In our case we tolerated poor results during most of this time, but finally obtained such control that we became accustomed to uniform results from a given plant. Occasionally, the tests would go haywire. Close control made it seem impossible that the operation could be faulty.

We were already aware that steels of different composition would react differently to the phosphate process, and have different appearances, yet seem to yield satisfactory results. A large number of panels was secured from different sources, phosphated in a single system, painted alike with a black enamel, baked alike, scribed to the steel in the center, and exposed in salt spray for the standard two week period. The results were surprising. Twenty percent were fairly good—Sixty percent were fair—and Twenty percent were poor. The appearance range is represented by Figure 1, and the whole summarized in a graph, Figure 2. This was an unexpected development and left us decidedly aghast, for we had been satisfied with at most two panels for our tests.

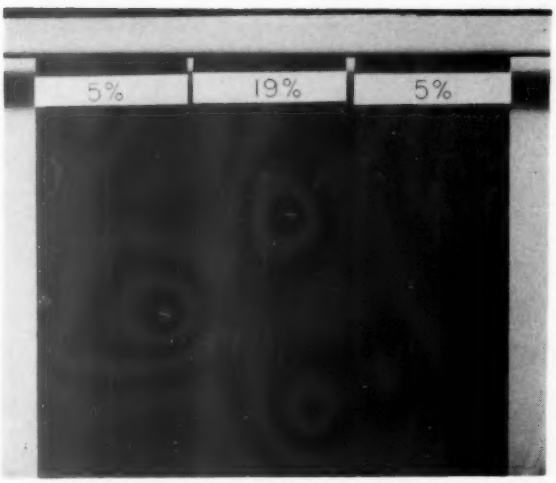

Figure 1. Appearance range of panels exposed to salts pray.

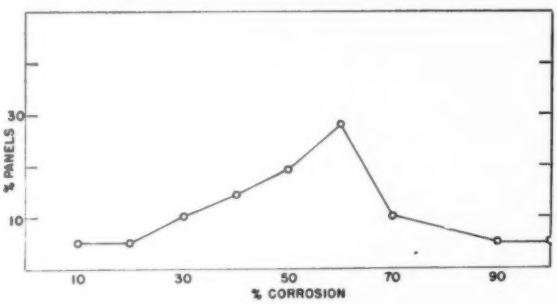

Figure 2. Graph summarizing appearance range.

It was our practice to purchase standard steel test panels from two sources, the *Parker Rust Proof Co.*, and the *Atlas Electric Devices Co.* both of whom meet the ASTM Specification. In order to determine whether or not there were differences in the steel from

*This paper was presented at the Meeting of the Protective Coatings Division of the Chemical Institute of Canada, Toronto, Feb. 23, 1956, Montreal, Feb. 24, 1956, by Wardley D. McMaster.

Mr. Wirshing is Head of the Chemistry Department, Research Staff, General Motors Corp. Mr. McMaster is Assistant Head of the department.

these two sources, we took panels from each, phosphated them through the same machine at the same time and painted them together. At the same time we included some steel obtained from one of the Chevrolet plants, and treated them all with zinc phosphate. After painting, all panels were scribed down the center to the bare metal in order to provide an area for corrosion to start. These panels were then subjected to salt spray in order to study their corrosion resistance. The test panels at the end of one week indicate that the Atlas steel is more subject to corrosion.

We allowed a duplicate set to remain in the salt spray for four weeks. Corrosion progressed in all cases, but the Atlas steel was still the worst by far.

We then tried treating the steels with an iron phosphate and the results at the end of one week in the salt spray show a reversal with the Parker steel being the worst. A duplicate set after four weeks in the salt spray again rate in the same order with the Parker panel being the worst.

So that you may get a direct comparison we have grouped four of the panels in Figure 3. This shows the

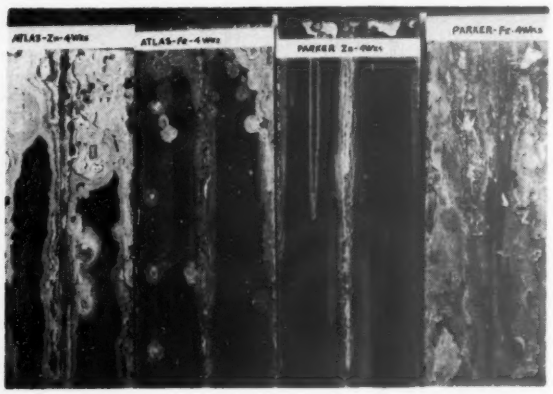

Figure 3. Atlas and Parker steels after four weeks in salt spray.

iron and zinc phosphate coatings on both the Atlas and Parker steel after four weeks in the salt spray.

This work seemed to substantiate our idea that there is a difference in steels even though they were bought under the same specification.

Our next step was to obtain steels from different shipments received at Chevrolet and Fisher Body plants. Nineteen different shipments from six different steel suppliers were obtained. These were phosphated, painted and tested in the salt spray. In Figure 4 we show samples from six different shipments of steel. Three were very bad and three were very good.

The problem now looked simple and straightforward. All we had to do was to determine the differences in these steels, make the proper corrections and the problem was solved.

Our thought, of course, was that these steels were different chemically. Therefore, our first approach was to analyze them and find the differences. Much to our surprise we found that although there were some small differences they did not fall into any pattern that would separate the good and bad steels. We made our analyses both chemically and spectrographically searching even for minute traces of things

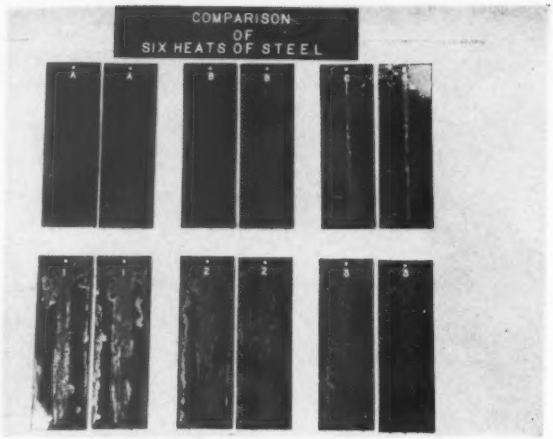

Figure 4. Comparison of six heats of steel.

seldom found in such steel: boron, aluminum, silicon, sodium and many others.

We then thought it might be surface roughness; careful studies were made and measurements taken with the profilometer and surfagauge, but no noticeable differences were found. About that time we had exhausted our supply of steel and were at somewhat of a loss as to how to proceed unless we could again obtain supply of both good and bad steels with which to continue our study.

We approached the *Armco Iron Co.* and they agreed to send us steel from a number of different heats, with the hope that some would be good and some bad. We eventually received samples from 19 different heats and fortunately once more steel from three of these heats gave us results that were very bad.

Having exhausted our efforts and ideas in trying to determine the differences between these good and bad steels we tackled the problem from another angle. What could we do to the bad steels to make them behave like the good ones?

We thought that perhaps gases such as hydrogen, nitrogen or oxygen might have been occluded in the bad steels, so we heated some of the panels before phosphate coating in the hope that any occluded gas would be driven off. Not only did the treatment fail to improve the bad steels, but it even made the good steels worse.

We then tried a special type of rinse following the phosphate coating. While this rinse seemed to help the poor steels somewhat the improvement was still far from what was desired.

Next we applied three different phosphate treatments, including the original dip Bonderite, (5 minute treatment), and an iron phosphate treatment. The bad steels were uniformly bad in all cases. We tried both pickling in sulfuric acid, and sandblasting, before phosphating. Sandblasting made a decided improvement. However, we were not sure whether this improvement came about because of the removal of something from the surface or because the surface was roughened, thereby giving a better anchorage for the paint. We also tried treating the steels with phosphoric and nitric acids as well as sanding the surface prior to rust proofing. All except the phosphoric acid helped somewhat.

Various other treatments were tried. Remember that these treatments were all given prior to the phosphate treatment. Electrolytic cleaning is not effective, nor is vapor degreasing. Flat polishing, which gives an extremely smooth surface, does an excellent job, indicating that the removal of something from the surface seems to be the answer.

We wondered how these steels would behave if they were exposed to the weather unpainted. We took three samples of bad steel and three samples of good steel, cleaned them thoroughly and exposed them on our test fences in Miami. There was a decided difference as before, after two days exposure. The only sad part about the story is that the three samples that rusted were the "good" steels, while the three that did not were the "bad" steels, Figure 5.

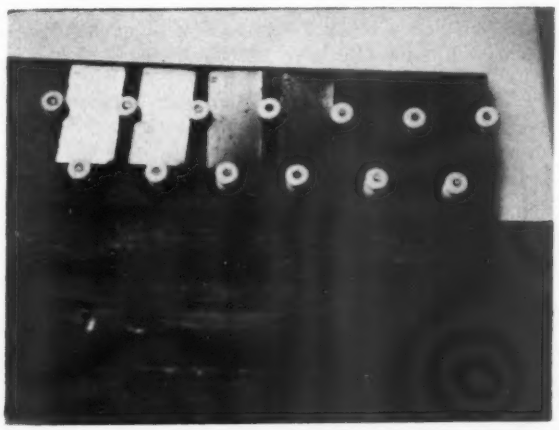

Figure 5. Six panels exposed on test fences in Miami.

This result made it appear that there was some coating on the surface of the metal, substantiating the flat polishing test. The nitric acid washes were therefore examined and found to contain appreciable quantities of lead. A review of the history of the steel suggested that lead lined pickling tanks might be the source of the contamination. It has been further noted that as each strip of steel is completed, the line is stopped until workers have had time to weld the two successive strips together. It is not at the moment clear whether this additional time in the pickling tank gives rise to the deposit of lead, or whether the welding operation might in any way introduce an electrolytic effect.

An Undercoat Problem

SINCE 1945 it has been difficult for any automotive company to meet the demands for its products; there has been a constant pressure to increase production without increasing the facilities. In order to meet this requirement we have made the first change in 30 years in our undercoat system, departing from the oil-base primer and surfacer, and adopting a synthetic-base combination undercoat. By so doing one of the two undercoat ovens theoretically could be eliminated, since the synthetic primer-surfacer needs only half the bake. On the other hand, production could be nearly doubled if the ovens were combined.

All plants did not have uniform facilities however, and numerous problems arose. Thus, the oil-type undercoats seemed to absorb oils without prejudice, and equally absorbed salts from water used in the wet-sanding operation so that blistering was not likely under reasonable humidity exposures. The synthetic type undercoats are more oil-sensitive and exceedingly water-sensitive. The usual addition of phosphoric acid to the water did not appear to solve our problem, and it was necessary to install de-ionizing equipment for water treatment.

Lack of adhesion is the cause of many consumer complaints, and is rather difficult to avoid with primer-surfacers that have satisfactory sanding qualities. This refers not only to the adhesion between the base metal and undercoat but also between the undercoat and topcoat. It is not easy to obtain a proper balance between the two. We have also found that the baking of the heavier combination undercoat is more critical, and there is danger of solvent lifting when the topcoat is applied. The Research High Film Build formulation is the only one that has been found satisfactory under these conditions, due to its Di-acetone content in place of more active solvents.

In order to check adhesion, we depend on our gravelometer, Figure 6. This has been designed for

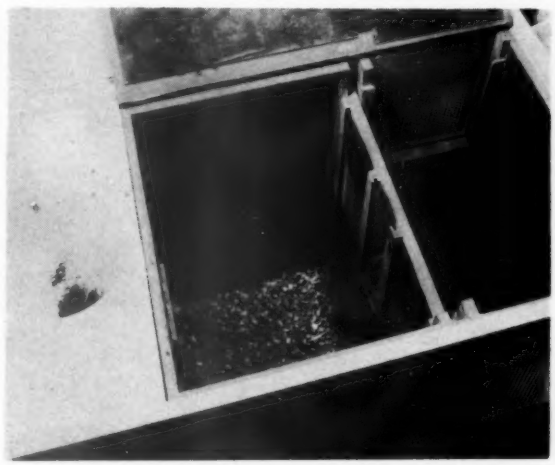

Figure 6. Gravelometer for checking adhesion.

use in a cold room at temperatures from −20° F to 20° F. Gravel is thrown against a test panel and failures vary with the nature and condition of the finish. Typical ratings are shown in the tabulation, Table I. This is a most satisfactory test, because it will duplicate the effect of driving on gravel roads rather well, and serves as an indication of any tendency to door-edge chipping.

Table I

GRAVELOMETER RATINGS

EXCELLENT	—Surface abrasion only
GOOD	—Pinpoint chips
FAIR	—Chips up to 1/8" diameter
POOR	—Chips up to 1/4" diameter
FAILED	—Nearly complete paint removal

Problems Arising From New Finishes

WE are now in process of getting into limited production on a new type of finish based on acrylic resin to be known as Lucite or Alpha Lacquer. This new finish is twice as durable as lacquer, just as lacquer is twice as durable as enamel. This statement may sound like propaganda to Canadians, but it is sometimes said that the colder you get the less you care, and these differences *are* most noticed in Florida. This acrylic is a polymer with fairly high molecular weight. This may explain its durability; it also explains an outstanding lack of adhesion unless precautions are taken. These precautions involve the undercoat and a special sealer coat.

A new test has been developed to test the adhesion, which is weakest in the plant after baking and fortunately improves with the passing of time. This is a tape test, designed to simulate the use of masking tapes in the plant. A finished panel is scribed with a V about ½" wide and 1" long. Standard Scotch tape is applied to cover the cuts, leaving a tail 3 to 5 in. long. It is rubbed into intimate contact with the film, using an eraser. The tail is pulled sharply, as nearly in the plane of the panel as possible, Figure 7. If the

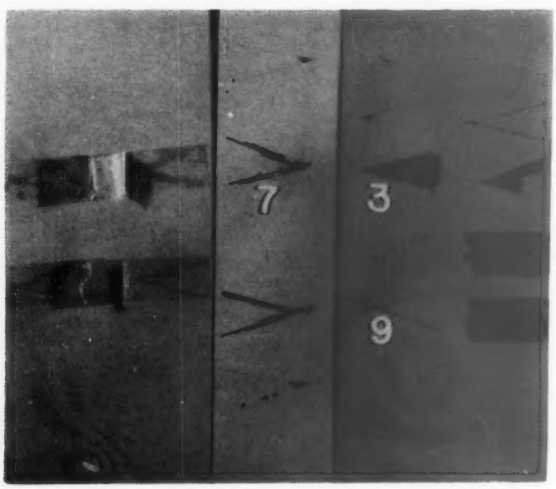

Figure 7. Testing adhesion by tape method.

finish leaves the undercoat more than 1/8" from the scribe marks, the adhesion is not satisfactory. For information, ten ratings are used, Table II.

Table II

TAPE ADHESION RATINGS

1 Peeling beyond lines and tape
2 " " " but under tape
3 Peeling within lines, Entire area
4 " " " >Half of area
5 " " " >Quarter of Area
6 " " " <Quarter of area

7 Jagged peeling along cuts to ⅛"
8 Smooth " " " " "
9 Trace of peeling
10 No peeling

As previously indicated the nature and bake of the undercoat are critical and all proposed undercoats must pass the severe testing procedure just mentioned. They must be able to pass when baked over a considerable range of conditions, simulating normal plant variables, as indicated. For this one test 64 panels are required for each undercoat or for each finish coat variant under study, Table III. The

Table III

PROGRAM FOR ADHESION TESTS

a. Undercoat film thickness, 1 & 3 mil. dry
b. Each film thickness of "A", baked 45 min. at 275°F. & 90 min. at 290°F.
c. Each film and bake under "B" to be both sanded and unsanded.
d. Each variety of "C" to be with and without a sealer coat.
e. All panels to receive a 2 mil. dry film of acrylic lacquer and each variant to have two finish bakes, 20 min. at 160°F. and 30 min. at 200°F.
f. Check adhesion after baking, and after 24 hours rest — 64 ratings.

test is performed immediately on removing from the oven and cooling, and again 24 hours later, simulating the period in the plant during which the cars are subject to taping. A perfect score, 10, for each panel will give 640. A primer-surfacer scoring less than 405 is not acceptable.

Cracking or checking of the finish has always been guarded against. Lacquers crack as a result of thermal changes—not significantly as a result of weathering like enamels; the acrylics crack as a result of plasticizer migration, we believe, and this may be produced by thermal changes and other weathering conditions. As in connection with adhesion, the undercoat type, thickness, and bake have a considerable bearing on the results. We must therefore test the suitability of the undercoat as well as the variations in topcoat formulation. The baking ranges are the same as for adhesion tests, but film thicknesses are different, Table IV. The test cycle is 48 hours long and at pres-

Table IV

BAKES FOR CRACKING TEST

UNDERCOAT: 60 min. at 290°F.
45 min. at 275°F.
Dry films of 1 and 3 mil.
TOPCOAT: 20 min. at 160°F.
30 min. at 200°F.
Dry films of 1½ and 4 mil.

ent, 15 cycles are required for approval. This cycle may be reduced to 24 hours if desired, but the standard is the same, Table V.

In preparing the weathering tests of the new acrylics, special programs are required. Because it is felt that trouble will arise only from possible incomplete cures the undercoat bakes are not made as extreme in range, being 30 and 60 min. at 275° F with 1 and 3 ml. films.

(*Turn to page 103*)

SOME APPLICATIONS OF COLORIMETRY

By
B. M. Baker*

COLORIMETRY is the science of measuring color, as the name implies. There are two distinct but similar methods of performing the objective measurement of color, that is, without the color judgment of the human eye.

In the first method of reducing the visual sensation of color to mathematics, a spectrophotometer is used. The amount of light reflected from an opaque sample is measured in each of several narrow wave-length bands across the visible spectrum from wave-lengths of about 400 to 700 millimicrons. The amount of light reflected in each wave-length band is measured as a percentage of that amount of light reflected by a specially prepared surface of magnesium oxide. In practice, a vitreous working standard, which has been calibrated against magnesium oxide, is usually employed.

If these percent reflectances are plotted against their respective wave-lengths, the graph is called a spectrophotometric curve. A recording spectrophotometer draws such a curve automatically. Since it is inconvenient to work directly from these curves in the specification of colors or the determination of color differences, the curve is usually converted mathematically to a set of three numerical designations X, Y and Z. These three numbers are called the C. I. E. tri-stimulus values for the color.[1] The initials C.I.E. are those of the French name for the International Commission on Illumination. The tri-stimulus values are a specification of color in themselves, but they are not completely satisfactory in the measurement of magnitudes of color difference. This deficiency will be discussed more fully later.

In the second method, a photoelectric tri-stimulus instrument, commonly called a tricolorimeter, is used. The performance of such an instrument is similar to that of a spectrophotometer except that three percent reflectances are measured through three wide-band glass filters instead of at each of several narrow wave-length bands. These three standardized glass filters appear to be green, red and blue, and the percent reflectances of the light transmitted by them are appropriately symbolized by the letters G, R and B respectively.

The three numerical values obtained by either of these methods, that is, the C. I. E. tri-stimulus values or the three percent reflectances G, R and B, are all that is required in the way of experimental data for any one color sample in the types of colorimetry problems which will be considered here.

Because it is so difficult to evaluate and interpret color differences from the experimental data of a spectrophotometer or a tricolorimeter in terms that a person experienced in visual color comparison can readily understand, it is necessary to convert these data to the coordinates of some three-dimensional color coordinate system or color space. For the interpretation and comparison of color differences, a prerequisite of such a color space is that its color coordinates be equally visually spaced. That is, equal straight-line distances within the space should represent equal degrees of visual color difference. This property of a color space is called uniformity. The deficiency in the C.I.E. system, mentioned earlier, is its lack of uniformity.

It is not within the intended scope of this paper to enter into further discussion on the pros and cons of the various colorimetric methods and instruments. For those whose interest in colorimetry goes beyond this paper, the author recommends a book entitled, "Color in Business, Science and Industry" by Deane B. Judd of the National Bureau of Standards, Washington, D.C.[1] This book may be considered as the modern American "bible" in the science of colorimetry.

Chromatic Value System

From among the color coordinate systems that might be used, the modified Adams chromatic value system[2,3] has been selected because, with the aid of tables now available,[1] it is the best compromise between ease of calculation and colorimetric fidelity. It is an

*B. M. Baker is connected with Canadian Industries, Ltd., Paint Division, Toronto, Ontario.
This paper was presented at the Tenth Divisional Conference of the Protective Coatings Division of the Chemical Institute of Canada in Toronto, Ont. and Montreal, Que., February 23 and 24, 1956.

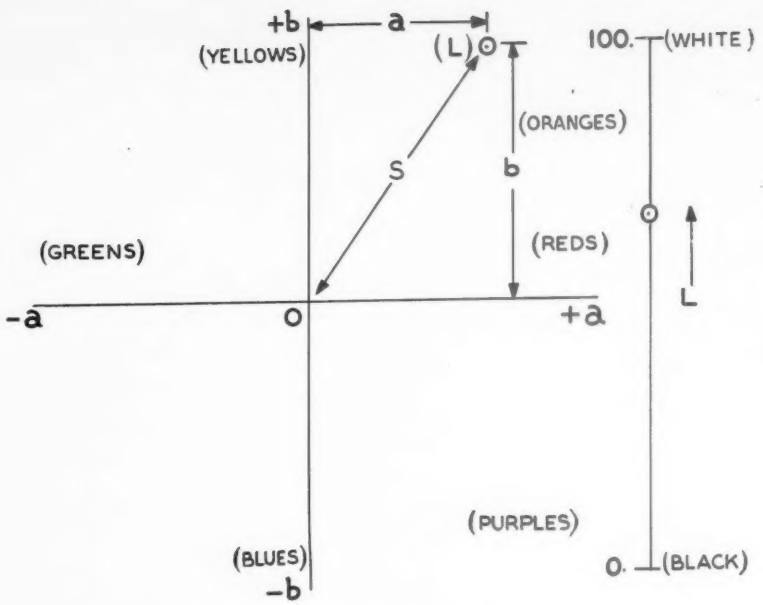

Figure 1. Chromaticity diagram and lightness scale.

approximately uniform color space in that its color coordinates closely approach equal visual spacing.

The three coordinates that describe a color in the modified Adams system may be quickly calculated with the aid of tables,[1,2] either from the values obtained with the spectrophotometer, X, Y and Z, or those from the tristimulus colorimeter, G, R and B. These three coordinates are L, a and b. In the color space defined by this system, L is the vertical coordinate corresponding to lightness, while a and b are two Cartesian coordinates which may be plotted on ordinary graph paper (Fig. 1). Such a plot of a and b is called a chromaticity diagram and may be considered as a plan view of the color space or some portion thereof. Since plotting in three dimensions is next to impossible without the use of descriptive geometry, the third coordinate, L, may simply be shown as a number near the plotted point for the color on the chromaticity diagram, or it may be plotted on a separate lightness scale, which is actually an elevation view of the vertical axis of the color space. Fortunately, in many routine colorimetric problems, this time-consuming procedure of plotting the coordinates is unnecessary.

The logic of this system of color coordinates becomes apparent when the systematic arrangement of colors, relative to one another within the color space, is noted. The vertical lightness axis, also known as the grey, neutral or achromatic axis, is perpendicular to the chromaticity diagram and is represented on this diagram by the point origin. The range of colors, lying along this neutral axis, varies from black, at the bottom of the scale, through the neutral greys of increasing lightness to white at the top of the scale. Any horizontal cross section or plane in the color space contains all the points representing colors whose lightness is equal to that of the neutral grey at the intersection of the axis and the particular horizontal plane. Any straight line, radiating from the origin of the chromaticity diagram, represents a vertical hue plane in the color space. All colors lying in this same vertical plane have the same hue. The hues of these vertical planes vary in a clockwise direction through the blues, greens, yellows, oranges, reds and purples; in the same order as the hues of the visible spectrum starting at the blue end. The purples, which do not appear in the visible spectrum, are actually blends of blues and reds which lie near the ends of the spectrum. The radial horizontal distance (s) that a color lies away from the grey axis is a direct measure of its saturation. In other words, the farther a color lies from the grey axis, the richer or more vivid it is.

The application of this system of interpretation to the data provided by a sufficiently sensitive instrument, permits a degree of reproducible color discrimination which is at least equal and, in most cases, superior to that of a skilled colorist.

It should be remembered, however, that when two material color specimens are compared and found to be an acceptable color match by any physical system which reduces a spectrophotometric curve to a set of three values, the color match may be considered valid only when either one of two conditions is satisfied. One condition that the color match will be visually inspected only under a light whose quality or spectral energy distribution is the same as that of the light source in the colorimetric instrument used. The alternative condition is that both specimens are known to be formulated from the same set of colorants, in which case the match will pass visual inspection under any light.

Color Specification

Any set of three colorimetrically determined coordinates would serve as a partial specification of a color, but, in the specification of color as in the specification of any other commodity to be purchased, it is also necessary to specify tolerances. In the modified Adams system, a color may be specified by stating its L, a and b values followed by the tolerance expressed as the upper and lower limits of each of these values. In effect, such a specification states that any color lying within the rectangular space so described would be an acceptable color match. However, colors lying in the outermost corners of such a space might prove to be unacceptable color matches primarily because they are farther from the standard, at the centre of the space, than are colors lying nearer the centres of the faces of the space. For this reason, it is usually preferable to express the tolerance as a maximum distance or total color difference from the standard in any direction. Such a tolerance yields a spherical space within which any color is an acceptable match. The radius of this

sphere is the maximum distance tolerance.

A supplier, attempting to meet such a specification, would determine the coordinates for a sample of the product he hopes to submit against the specification and would compare these coordinates with those of the specified standard. The comparison would be based on the straight-line distance between the standard and his sample. This straight-line distance represents the overall or total visual color difference, and it may be calculated from the equation:

$$\Delta E = \sqrt{(L_1 - L_2)^2 + (a_1 - a_2)^2 + (b_1 - b_2)^2}$$

where ΔE is the total color difference expressed in the widely accepted units of color difference known as N.B.S. units after the National Bureau of Standards, Washington, D.C. L_1, a_1, b_1, and L_2, a_2, b_2 are the coordinates of the two colors being compared.

Because the accuracy may vary slightly from one instrument to another, it is advisable for the customer to supply, as part of the specification, a specimen of the required color so that the manufacturer can compare his product with the standard on the same instrument. In this case, the specimen standard replaces the numerical standard, but the tolerance for the maximum total color difference remains unchanged. This practice minimizes arguments over the color acceptability of the product, and thus helps to maintain goodwill between the parties.

Production Color Control

The application of colorimetry to production color control is very similar to its use in color specification. However, in the absence of a definite customer's specification for tolerance, it is necessary for the manufacturer to establish the tolerance. The tolerance must be set small enough to prevent customer rejects but, on the other hand, it should be as large as possible to minimize the cost of tinting. A colorimetric survey of recent past batches shipped to the customer will reveal an approximation of the maximum tolerance when any color complaints against these batches are taken into account.

A phase of production color control where colorimetry is practically indispensable is the maintenance of color standards. The modified Adams coordinates L, a and b should be determined for the material standard when it is first prepared. Then, at predetermined time intervals, a new material standard may be reprepared so that the original color coordinates are reproduced. The time interval should be short enough that no appreciable color drift has occurred in the material standard. The length of the interval naturally depends on the tendency of a given material to discolor with age, and it must be found experimentally.

Evaluation of Color Change

The degree of color change, exhibited by a product subjected to exposure or storage tests, can be evaluated simply by determining the total color difference (ΔE) between the exposed and unexposed specimens of the material. Such a total color difference may be compared directly with those of other materials for grading purposes.

However, there are times when the problem of color change evaluation becomes a matter of personal taste for, although two materials may discolor to the same degree, an experienced technician might prefer the direction in which one material changed over that of the other. In this case, he is obviously interested in the degree of color change in some particular direction or dimension rather than the overall or total color change. Situations of this nature do not render colorimetry useless. On the contrary, it is a simple matter to plot the color points for the various specimens under consideration on the chromaticity diagram and lightness scale and, by comparing the lightness differences, saturation differences and hue differences individually with the visual grading, a close relationship will become apparent between visual preferences and one of these components of color difference or, possibly, a combination of two of them. Once the critical direction has been selected in this manner, a relatively simple mathematical equation expressing the degree of color change in this direction can be formulated.

Tinting

As an aid in the tinting process, this system of color measurement and interpretation indicates in what direction and to what degree the color of an off-color product must be changed to match the standard. This application, in itself, is a considerable improvement over the visual practices of expert colorists because the human eye cannot measure the magnitude of color differences accurately and it even becomes confused in direction when the color differences are very small. The average number of tinting steps required per batch to match the standard is considerably reduced by objective colorimetry simply because the color difference evaluation is more precise and accurate.

Colorimetry cannot, however, directly provide information on the quantities of corrective colorants required to accomplish the matching of the standard. To do this, it is necessary to know the effects that the various colorants would have on the off-color product. That is, the direction and magnitude of the color change effected by a unit weight of a colorant must be known in advance. The methods that have been devised so far for systematically predicting the quantitative colorant composition in this manner, have proven to be laborious and time-consuming. Nevertheless, it has been found that almost perfect color matches can usually be obtained in only two tinting steps with non-metallic colors.

The possible production savings, represented by the difference between two tinting steps per batch and the high average number of steps normally experienced without the aid of colorimetry, are certainly sufficiently tempting to justify further investigation into reducing the cost of colorimetric tinting methods.

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2. Glasser and Troy, J. Opt. Soc. Am., 42, pp. 656-658, (1952)
3. Nickerson and Stultz, J. Opt. Soc. Am., 34, p. 550, (1944)

HOW TO MAKE A SIMPLE "BLISTER BOX"

By
Norman G. Tompkins*

KNOWING that a water-base paint formulated with a polyvinyl acetate copolymer is blister and stain resistant is one thing. Demonstrating the point to dealers and consumers is another. Here's an inexpensive blister-box demonstrator that puts the point across with a bang. Simple and inexpensive to build, the blister-box can be used in the laboratory, at exhibits, or for in-store demonstrations by paint retailers themselves.

To build it you'll need:

1) Standard 5-gallon square can with 2½" opening.
2) Soft pine furring strips (8 pieces 1" x 2" x 13" long) (8 pieces 1" x 2" x 7 11/16" long).
3) 4 pieces of 8" Red Cedar siding, 12" long (Clear, unstreaked cedar will give best results. Gummy streaks could stain the paint film.)
4) Two dozen large brass wood screws (#10 x 1¼").
5) Two-hole rubber stopper.
6) Short length of copper tubing to fit hole in stopper.

Figure 1. Blister box ready for testing.

7) 3" length of rubber tubing to fit snugly over copper tubing.
8) Wooden plug to seal one end of rubber tubing.
9) Laboratory-type Centigrade thermometer.
10) Plastic caulking compound.

How to build (See Fig. 2):

1) With tin snips, cut rectangular holes (5¾" x 8½") in sides of can, about 2¾" from top, (see A).
2) Wedge the 2" pine strips into the can to form a framework for attaching cedar panels (see B).
   Plan view shows top and bottom view of vertical and horizontal strips wedged inside can. (Vertical strips . . .braced in position by horizontal strips).
3) Pre-drill 8" cedar panels.
4) Before placing panels in position on can, apply a "bead" of plastic caulking

(*Turn to page 90*)

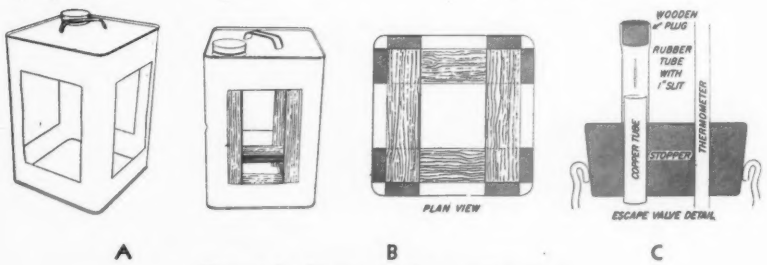


Figure 2. Stages in the construction of blister box.

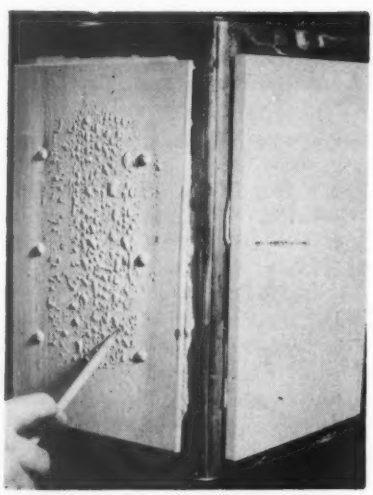


Figure 3. Test shows paint blistering.

*Mgr., Paint Research Laboratory, Dewey and Almy Chemical Co., Div. W. R. Grace & Co.

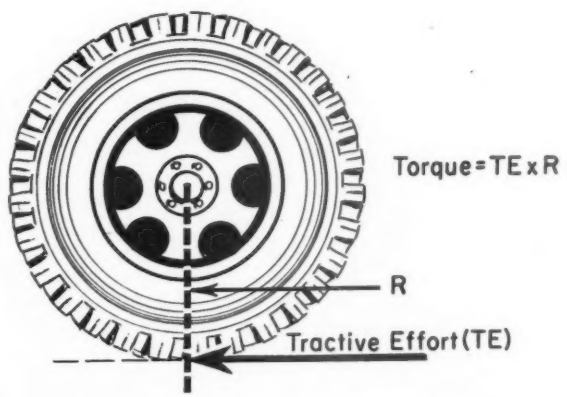
FOUR THINGS YOU SHOULD KNOW ABOUT DRIVE MECHANISMS WHEN BUYING AN INDUSTRIAL TRUCK

WHEN you're buying a powered industrial truck—fork, platform, or tractor unit—what do you look for? Performance and cost come first, of course. Next, you'll turn to construction.

To help you in judging engineering design, the following tips with regard to drive mechanisms have been culled from a study by *H. E. Milz, V. P. in Charge of Engineering, The Mercury Manufacturing Company.* Of all construction features, the driving axle, says Milz, is perhaps the most important single component. It converts the energy received from the power source (electric motor or gasoline engine) into torque—the force that drives the wheels.

1. You Need High Torque

Torque is simply the twisting force exerted by a rotary force working through its radial distance. For an industrial truck, the torque needed varies with the tractive effort, which depends on the combined weight of both truck and load and also on the maximum grade.



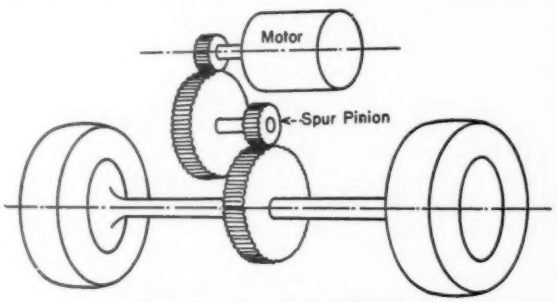
A heavy load and a steep grade would require a high torque, which in turn would cut the truck's operating speed drastically. Starting the truck also requires high torque. Therefore, as an industrial truck needs both high torque and a slow speed at the driving wheel, a speed-reducing mechanism must lie between wheel and motor. Pick a series-wound motor to give you high starting torque.

2. You Have To Reduce Speed

You can get necessary speed reduction by worm gearing. It's quiet and simple, but it's also inefficient (70% or even lower) under heavy loads and slow speeds.

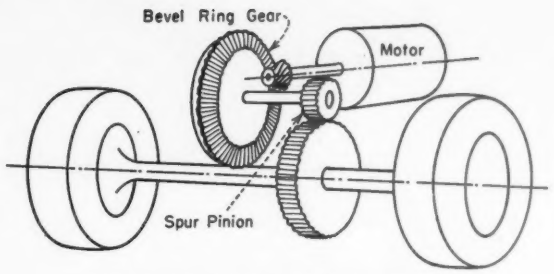
Internal gearing, generally used along with a bevel-gear reduction, is highly efficient over a wide load-and-speed range. A second advantage—reduction of torque on drive shaft and differential—is especially desirable on steerable wheel axles as universal joints can be made smaller. But internal gearing is costly, complicated, and difficult to enclose and lubricate.

Spur gearing too is efficient over a wide range of loads and speeds. Its principal disadvantage is that straight spur gearing would require placing the motor parallel to the drive shaft, that is, cross-wise of the truck. Such a position would make inspection and maintenance difficult. This drive is also noisy.



Differential with all Spur Gearing

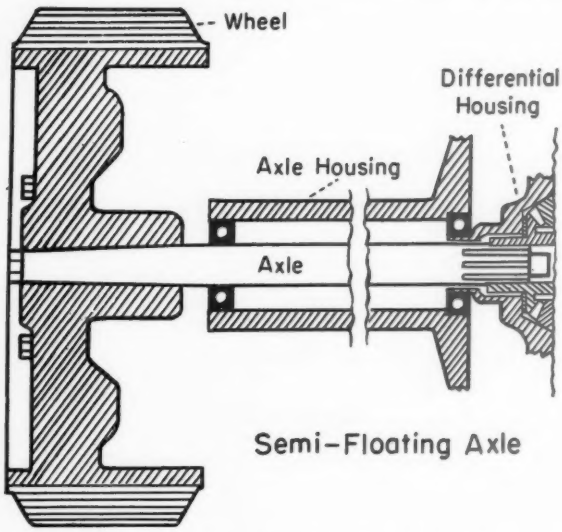
Combination bevel and spur gearing permits placing the motor lengthwise of the truck. This drive makes all parts accessible, yet retains excellent efficiency over a wide speed-and-load range. The first reduction —spiral bevel pinion and gear—is smooth and quiet at high speeds. The second reduction, with spur gears, runs slowly enough that it too is quiet. The combination presents no lubrication problems and permits use of wheel brakes.



Differential with Spur and Bevel Gearing

3. The Best Axle For Your Job

Next, you must pick the type of drive axle best suited to your work. The so-called dead axle and the plain live axle are obsolete in industrial-truck design. The semi-floating axle, desirable for light trucks as it is economical to manufacture, has axle shafts relieved of all driving-gear tooth pressure. Bearings in the



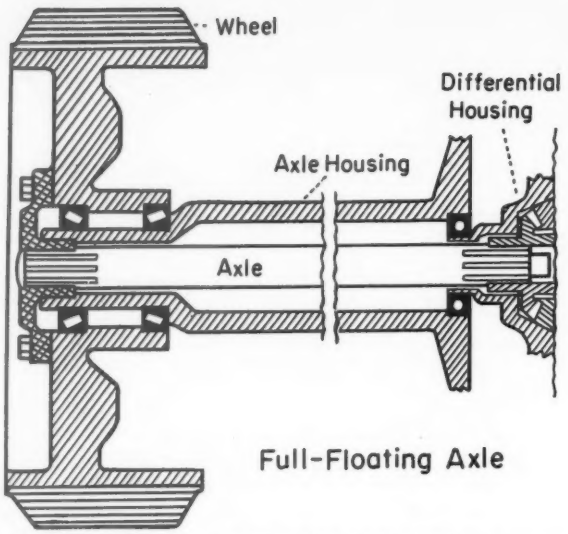
Semi-Floating Axle

axle housing, instead of the axle shafts, carry the differential gear. Axle shafts, made smaller in diameter than the bore of the differential-housing hubs, pass through without touching them; this establishes driving connection with the differential bevel gear at the splined ends of the shaft.

A still better design is the full-floating axle, with the outer ends of the driving shafts relieved of all bending stress in the same way as the inner ends. Axle tubes extend entirely through the wheel hubs, and wheel bearings are mounted on the outside of these tubes. The axle shafts extend through the housing and their outer ends connect with wheel hubs through driving dogs or positive clutches.

For heavy-duty service the full-floating axle is considered to be the best. This type of axle also permits removing the drive shaft without removing wheel or axle. A modification of the full-floating design transmits driving torque from shafts to wheels by bolted driving flanges.

Axle mounting is an important feature to check. The drive axle must be attached securely to the frame to absorb the heavy torque reaction in starting, stopping, and climbing grades.

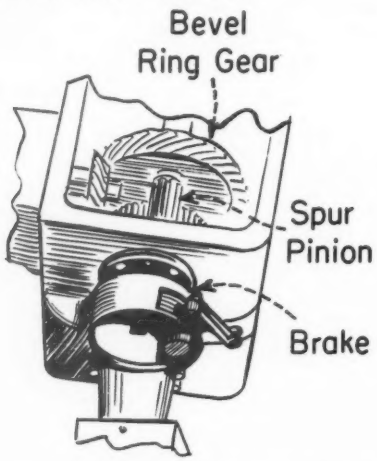


Full-Floating Axle

Platform-lift, burden carrying and certain tractor units should have steerable drive axles for good maneuverability. Such an axle has steering knuckle pivots at the housing ends, with the wheels mounted on the knuckles and driven through a universal joint in the drive shaft. With a single ball-type universal joint, the steering angle on this type of truck is limited to 30 deg.

4. You Need Good Brakes

For safe operation, industrial trucks must have powerful, dependable brakes. They should be located on the driving axle as close to the drive wheels as possible. Wheel brakes, preferably of the internal expanding type, are best, except where space does not permit their use and also on trucks having steerable drive axles. A desirable feature on large fork trucks is spring-applied brakes that go on automatically when the driver leaves the truck.



Spur-Pinion-Shaft Brake

When wheel brakes cannot be used, Mr. Milz prefers to put the brake on the spur pinion shaft. Doing so avoids transmission of braking force through the bevel-gear reduction and gives a smoother action than is possible with the brake mounted on the motor shaft.

METHOD FOR EVALUATING FUNGUS GROWTH ON LARGE AREAS

By
Samuel Shapiro*

IN EVALUATING the effectiveness of paint fungicides for preventing mildew growth, 3 x 4 inch panels coated with various test paints are exposed in the humid atmosphere of the Tropical Test Chamber at Fort Belvoir or other selected test sites. All panels are examined periodically, and the amount of fungus growth appearing on each individual panel is estimated according to the scale shown below:

Degree of Fungus Growth	*Numerical Value*
No growth	1.0
Very slight growth	1.5
Slight growth	2.0
Slight to moderate growth	2.5
Moderate growth	3.0
Moderate to heavy growth	3.5
Heavy growth	4.0

The assignment of numerical values to designate the amount of mildew on test panels makes it a simple matter to evaluate various fungitoxic treatments according to their ability to inhibit fungus growth. The average obtained from a series of readings of panels having the same treatment may be considered as being representative of the entire lot.

Although it is rather easy to apply this evaluation system to small panels, difficulty is often encountered when an attempt is made to evaluate panels of large areas, especially when irregular and varied degrees of fungus growth are distributed over their surfaces.

*Mr. Shapiro is connected with the Fungus Control Section, Materials Branch, U. S. Army, Corps of Engineers, Fort Belvoir, Va.

Template System

This difficulty was overcome by devising a method which permits the evaluation of a series of small random locations from which is obtained an average rating for the entire area. Basically, the method depends upon the use of a template (Fig. 1) to outline, for evaluation

Figure 1. Using the template to evaluate the fungus growth on a door panel.

purposes, a number of small sections of the test surface. The arithmetical mean obtained by evaluating a predetermined number of small sections selected without bias from the test area can be considered as representative of the amount of fungus growth present on the entire surface.

Using this template system to evaluate the amount of fungus growth on a 4 x 8 foot Cellotex panel located in the ceiling of a dwelling at Curundu, Canal Zone, two observers independently obtained means of 1.8 and 2.0. This same method of comparison gave results closely paralleling the above when the experiment was carried out on other panels.

Number of Readings Necessary—A statistical analysis showed that a minimum of twenty-one random observations is necessary in order that a 0.5 difference between the means be significant at the 5% level. This figure (0.5) represents the difference between any two readings. The selection of the areas for estimating the fungus growth should be as unbiased as possible. Fig. 2 shows a suggested

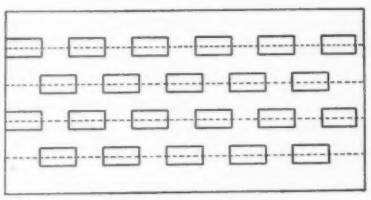


Figure 2. A suggested arrangement which may be used to take 22 observations on a rectangular panel. Each reading represents one percent of the total area.

arrangement for 22 observations on a rectangular area. This layout can be used as a guide for making inspections of panels on exposure sites.

Size of Template Opening—For fairly accurate determinations the size of the template opening should be governed by the area of the panels to be evaluated. If the template is so constructed that the opening is 1/10 of the width by 1/10 of the length of the test panel, the area exposed will be of a size convenient for evaluation. Each reading will then represent one percent of the total area. Should it be necessary to evaluate the fungus growth on an unusually large size

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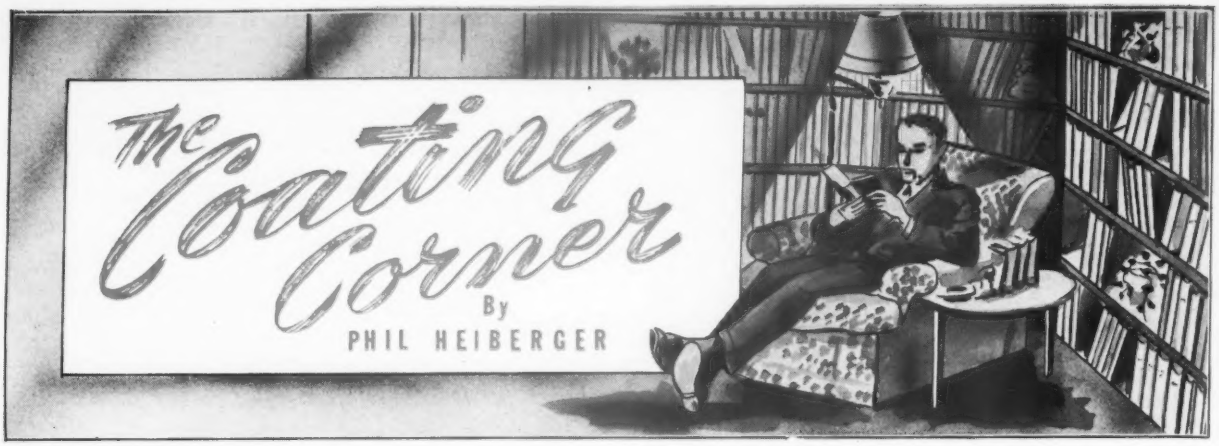

The author continues his random reflections on various aspects of the paint industry. The opinions expressed in this column are his alone and do not necessarily reflect those of this publication.

Double Feature Today!

WHEN you've decided to take the kids to a movie and Junior wants a rough and tumble Western and Sister prefers a tender, romantic love story, do you throw up your hands in disgust and say "No man can serve two masters?" Of course not. You head for a double feature.

Defries, Schneider, Fram, and Leonard of the Army Prosthetics Research Laboratory at the Walter Reed Army Medical Center found that certain plastic conflicts can be resolved in the same way.

During investigation of latex-dispersed acrylate elastomers intended for casting cosmetic gloves in porous gypsum molds, they noted that compounded materials which attained optimum bulk properties developed surface tack when the material, in rubbing against itself under conditions of use, was subject to cyclic shear and compressive forces. Sprayable plastic coatings, on the other hand, were unsatisfactory because of adhesion difficulties, loss of mold detail, and development of surface gloss.

Resorting to the principle of the double feature, they developed a technique, termed "dilaminar film casting", which comprises the

Phil Heiberger

successive deposition of two or more materials on a porous plaster mold surface. This technique is described in their paper entitled *"Dilaminar Elastomeric Films" published in the Journal of Polymer Science, Vol. XX, 267 (1956).*

The first material is slush cast in the usual manner and its parent latex removed after sufficient deposition is achieved. A second latex is then substituted before the interface dries, and the build-up is continued to the final desired thickness.

The authors note that the use of dilaminar or composite structures is well known in the general field o engineering materials. For ex ample, wooden beams are rein forced with steel strips for en hanced strength, and vinyl plastic steel composites comprise a material retaining the rigidity of steel and the chemical resistance of the exposed vinyl surface. Surface resistant and surface hardened vinyl plastics have been made by solvent extraction of a plasticizer from the surface of a plasticized polyvinyl film, thereby forming a composite structure. Composite automobile tires are known consisting of a surface layer of an abrasion resistant polyurethane elastomer and a natural or synthetic rubber substrate.

Paint technologists, too, often employ this principle. We use multiple coating systems for furniture, automotive, appliance, and corrosion resistance finishing. Maybe some other vexing problems would yield to this kind of treatment.

So the next time you're asked to formulate a coating with a set of properties which in theory indicate diametrically opposed synthetic and compounding procedures, it might be wise to bear the double feature approach in mind.

Lest anyone infer from the above that this approach is universally applicable, we hasten to repeat a famous story. When the beauteous and celebrated dancer Isadora Duncan suggested to witty George Bernard Shaw that they pool their biological resources to produce an offspring who would, of course, be blessed with his brains and her looks, he retorted characteristically, "And if the poor child inherits *your* brains and *my* looks?"

On the Biosynthesis of Oils

IS there a radioisotope in your future? Then take a look at a brief article entitled "*Biosynthesis of C^{14}-Labeled Cottonseed Oil from D-Glucose-6-C^{14}" by F. Shafizadeh and M. L. Wolfrom in the Journal of the American Chemical Society 78, 2498 (1956).* You'll find it valuable both for its references and as an example of a potentially useful technique. The article presents direct evidence to indicate that in the maturing cotton boll, D-glucose (as D-glucose-6-C^{14}) is partially converted to the seed oils, possibly through a breakdown by the glycolytic process.

While the origin of fats and their biosynthesis from carbohydrates in animals and microorganisms, through the formation of two carbon fragments (active acetate), has been well established by the use of carbon isotopes; similar investigations in the higher plants have been conspicuously lagging. Consequently the present knowledge (prior to this paper) concerning the biosynthesis of oils in higher plants is still based mainly on indirect evidence such as the measurement of the respiratory quotient and reduction in the supply of carbohydrates present during the period of rapid oil formation.

Graft

IF you think paint formulation is already too complex, my advice is to ignore U. S. Patent 2,749,248. . . .

Within the past few years, polymer chemists have been busily investigating the myriad aspects of copolymerization thereby evolving various esoteric combinations of random, alternating, block, and graft copolymers. In the latter type, a purposeful heterogeneity can be obtained by designing structures having branches of one composition "grafted" onto a backbone chain of another composition, e.g., vinyl acetate copolymerized onto polyvinyl alcohol, styrene copolymerized onto polybutadiene, methyl methacrylate bonded onto natural rubber, etc.

Some graft copolymers have already entered commercial channels because certain critical properties have been enhanced, for example, tensile strength, low temperature flexibility, solubility, and compatibility. One assumes that grafting occurs by chain transfer or by monomer addition to polymer double bonds; in other words, by known polymerization mechanisms utilizing organic molecules.

Therefore when one finds that graft polymerization techniques have been extended to include inorganic backbones, the ramifications can become quite exciting.

U.S. Patent 2,749,248 (issued June 5, 1956) awarded to *Richard E. Benson* of the *DuPont Company* carries the imposing title: "*Organophilic Titania Powders Containing a Polymerizable Ethylenic Monomer Bound to Fractured Surfaces Thereof and Their Preparation.*" In essence the patent describes a process for preparing finely divided TiO_2 particles bound (coated, adsorbed, grafted or what have you) to a vinyl type polymer.

The process of this invention consists of grinding granular TiO_2 (i.e., titania in the form of pellets) to a fine powder while in contact with a vinyl type monomer. The secret apparently lies in the fact that during this grinding action in a pebble mill, the newly formed surface fractures contain "activated" sites which can "copolymerize" with the monomers.

The patent describes pigments containing organic material bound to the titanium dioxide in amounts equivalent to 0.41 to 5.0% carbon. Those pigments containing 0.5 to 5.0% carbon are highly organophilic. The organophilic characteristics are retained even after thorough extraction with organic solvents or after lengthy refluxing in boiling water.

Not only am I intrigued by the daring and creativeness of this approach but I am awed by the nightmarish complexity it portends for the future of paint formulation.

NEWS

Complete Plans for Paint Industries' Show

Plans for the Federation of Paint and Varnish Production Clubs' 1956 Paint Industries' Show have been completed and all space has been reserved, it was announced by William L. Foy, show committee chairman.

The show will open Oct. 22 in the Netherland-Hilton Hotel in Cincinnati and will run concurrently with the 34 annual meeting of the Federation. Both will close Oct. 24.

Four sub-committee chairmen will assist Mr. Foy with arrangements. They are: Walter L. Ziegler—Registration; Lawrence Bing—Banquet, Dance and Entertainment; Harry Pansing—Ladies Entertainment, and Carl J. Opp—Floor.

Among the companies to whom exhibit space has been assigned are:

Abbe, Paul O., Inc.; Advance Solvents & Chemical Corp.; Ambrose, C. M. Co.; Anderson-Prichard Oil Corp.; Archer-Daniels-Midland Co.; Atlas Electric Devices Co.; Bakelite Co.; Baker Castor Oil Co.; Barrett Div., Allied Chemical & Dye Corp.; Bennett Industries, Inc.; Borden Co., Chemical Div.; Brighton Corp.; Buckman Laboratories, Inc.; Burt Machine Co.; Cabot, Godfrey L., Inc.; Cambridge Industries Co.; Carbide & Carbon Chemicals Co.; Carbola Chemical Co., Inc.; Carbon Dispersions, Inc.; Cargill, Inc.; Catalytic Combustion Corp.; Celanese Corp. of America, Chemical Div.; Celanese Corp. of America, Plastics Div.; Chisholm-Ryder Co. of Pa.; Colton Chemical Co.; Columbian Carbon Co.; Commercial Solvents Corp.; Cuno Engineering Corp.; Day, J. H. Co., Inc.; Dewey & Almy Chemical Co.; Dow Chemical Co.; Dupont, E. I. de Nemours & Co., Inc.; Eastman Chemical Products, Inc.; Epworth Mfg. Co.; Farnow, Inc.; Firestone Plastics Co.; General Electric Co.; Goodyear Tire & Rubber Co.; Harshaw Chemical Co.; Heckel Publishing Co., Inc.; Hercules Powder Co.; Heyden Chemical Corp.; Hilton-Davis Chemical Co.; Hockmeyer, Herman & Co. Kellogg, Spencer & Sons, Inc.; Kent Machine Works, Inc.; Kinetic Dispersion Corp.; Lacquer Information Center; Lehmann, J. M. & Co., Inc.; Macbeth Daylighting Corp.; Metals Disintegrating Co., Inc.; Mineral Pigments Corp.; Minerals & Chem. Corp. of America; Monsanto Chemical Co.; Morehouse-Cowles, Inc.; Naftone, Inc.; Neville Chemical Co.; Nopco Chemical Co., Inc.; Nuodex Products Co., Inc.; Oronite Chemical Co.; Pacific Vegetable Oil Corp.; Patterson Foundry & Machine Co.; Pennsylvania Ind. Chemicals Corp.; R-B-H Dispersions; Reichhold Chemicals Inc.; Rohm & Haas Co.; Ross, Charles & Son Co.; Ross & Rowe, Inc.; Sharples Chemicals, Inc.; Shawinigan Products Corp.; Shell Chemical Corp.; Shell Oil Co.; Silberline Mfg. Co., Inc.; Tall Oil Association; Thibault & Walker Co.; Troy Chemical Co.; Troy Engine & Machine Co.; Union Bag & Paper Corp.; U. S. Stoneware Co.; Washburn, T. F. Co.; Williams, C. K. & Co.; Witco Chemical Co.

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Announce Epoxy Pact

Conclusion by Ciba Ltd. and Devoe & Raynolds Co., Inc., of a non-exclusive epoxy resin patent license agreement for the United States and Canada was jointly announced by the two companies.

MONEY FOR RESEARCH: Presenting a check for $1000 to Rutgers University is Dr. Zeno W. Wicks, Jr. (right), general manager of the Interchemical Corporation's Central Research Laboratories. Accepting it is Dr. P. A. van der Meulen (left), director of the University's School of Chemistry. The money will be used to purchase equipment for research involving Carbon 14, a radioactive isotope. Investigations will be carried out using C-14 to study reactions involving the rearrangement of the structure of organic compounds. A second phase of research will involve kinetic study in which an exchange reaction is carried out between C-14 compounds and non-radioactive substances. The project will be under the immediate supervision of Dr. Broderick A. Barnes (center), associate professor of organic chemistry.

To Build $11 Million Plant For Methyl Methacrylate

An $11 million plant for the manufacture of methyl methacrylate will be built by Hercules Powder Co. and Imperial Chemical Industries Ltd., of England. The new plant with an annual capacity of 35 million pounds will be built on a 20-acre site at Louisiana, Mo., adjoining Missouri Ammonia Works, owned and operated by Hercules.

A new company will be formed to build and operate the methyl methacrylate plant, with Hercules and Imperial Chemical Industries Ltd. each owning 50 per cent of the new corporation.

Methyl methacrylate is a chemical with diverse applications, most commonly known today as a glass-like plastic product widely used in aircraft, automobiles, and illuminated signs. The new company will make and sell both monomer and polymer in various forms.

A major factor in selecting this site was the ready availability of key raw materials. Ammonia and methanol will be supplied by the Missouri Ammonia Works and natural gas is available from an adjacent pipeline from Texas gas fields. Hercules produces a fourth raw material, acetone, at one of its newest chemical plants in Gibbstown, N. J.

Imperial Chemical Industries, one of the world's largest chemical companies, was the pioneer of the process used throughout the world for the synthesis of methyl methacrylate monomer. I.C.I. will bring to the new company its production, research, and technical sales service experience developed over twenty years as a major manufacturer of methyl methacrylate in all its forms. British Treasury sanction for I.C.I. to participate in this project has been applied for.

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New A.C. Horn Plant

Construction began last month on a 33,500 square foot manufacturing plant for the A.C. Horn Co. of Texas. Site of the new plant, whose target date for completion is late November, is an 18 acre stretch of land in Houston. The land is owned by Sun Chemical Corp., the parent company.

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A-D-M Moves N.Y. Office

The New York regional sales office of the Chemical Products Div., Archer-Daniels-Midland Co., has moved to larger quarters on the 16 floor of the Transportation Building, 225 Broadway, New York 7, N. Y. The old address was ninth floor, Woolworth Building.

NEWS

Naval Stores Conference To be Held Oct. 8-9 in Fla.

The second Naval Stores Work Conference, sponsored by the Naval Stores Station, Southern Utilization Research Branch, Agricultural Research Service, and the Lake City Branch of the Southeastern Forest Experiment Station, Forest Service, U. S. Department of Agriculture, will be held Oct. 8-9 at the Roosevelt Hotel in Jacksonville, Fla.

The conference will feature talks by key men from the various naval stores producing and consuming industries who will discuss various factors affecting the production and utilization of naval stores products.

Although advanced registration for the conference is not required, those wishing to attend should notify E. L. Patton, Head, Naval Stores Research Section, Naval Stores Station, Olustee, Fla.

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Multi-Viscosity Polybutene

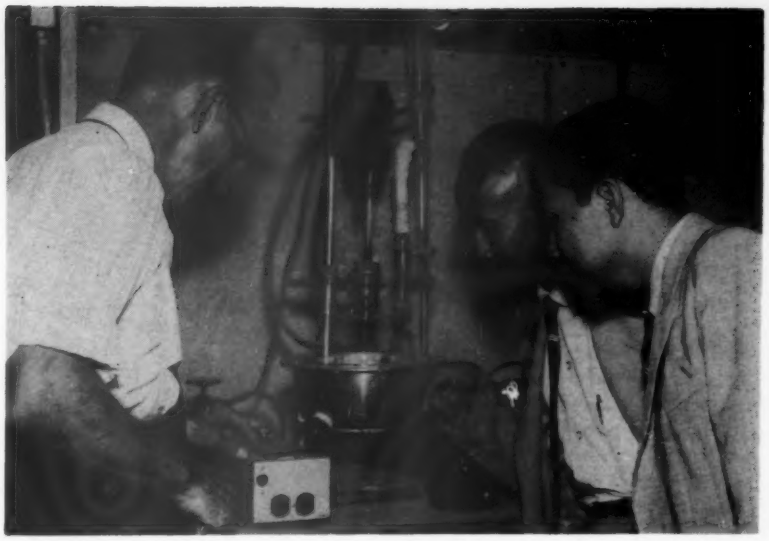
Cosden Petroleum Corp. has announced the setting up of marketing and distribution facilities for its own multi-viscosity polybutene under the trade name "Polyvis." This expanded operation was made possible by the construction of a new polymerization plant at Big Spring, Texas, said to have an annual capacity of a million gallons of low-viscosity polybutene.

Polybutene is an important component in the manufacture of caulking and sealing compounds, pressure sensitive adhesives, and in vibration dampeners.

•

Cal Ink Technical Director

William H. Brandes, president of The California Ink Co., has announced the appointment of W. C. Parle as technical director, in charge of the activities of all the firm's laboratories. Now staffed by over 50 chemists, Cal Ink intends to enlarge its research and technical staff at the Berkeley plant to 75 by the end of the year.



INDONESIAN VISIT: Bibit Nusan and Mas Suhana of the Government Testing Laboratories in Bunding, Indonesia recently visited the Organic Coatings Laboratory at the University of Florida to discuss the latest developments in raw materials, manufacturing processes, and testing equipment for paints. Photo shows Professor Henry F. Payne explaining laboratory equipment used for processing syntehtic resins.

Du Pont to Build New K.C. Sales Office, Warehouse

A new regional sales office and warehouse for the Du Pont Company's Finishes Division will be built in Kansas City, Mo., at 6201 Manchester Trafficway in the new industrial park development known as Byrams Ford Park, the company recently announced.

Construction will start in the near future and the building is expected to be ready for occupancy before the end of the year.

The new facilities are designed to improve service to users of industrial finishes, retail paint dealers, painters and painting contractors, users of maintenance paint products, and automobile refinishing shops. It will provide additional warehouse space required by the company's expanding sales in Kansas City and the surrounding area. Space will also be provided for establishment of a sales service laboratory.

•

T. F. Gowdy Co. Appoints

T. F. Gowdy Co., New York City, has announced the appointment of the following agents to handle the sale of "Selected Fish Oil" in their respective territories: Fred W. Kamin, Lakewood, Ohio; Arthur C. Trask Co., Chicago, Illinois, and Harry A. Baumstark & Co., St. Louis, Mo.

Evans Research Starts Air Force Adhesion Study

A fundamental study of adhesion has been initiated by Evans Research and Development Corp., chemical consultants of New York City, under a contract granted by Wright Air Development Center, Air Research and Development Command.

The first phase of this research program calls for the determination of surface free energies of polymers and metals by use of solid state creep.

Specialized instruments for this purpose have been designed by the physics department, and are now under construction at the Evans Research laboratories.

•

A-D-M Buys Into Arco

Archer-Daniels-Midland Co., Minneapolis, has purchased half-interest in the Applied Radiation Corp., a producer of linear electron accelerators and other electronic equipment it was announced jointly by the two companies.

ADM is one of the largest processors of agricultural crops and marine oils, and is a major producer of chemicals. The Applied Radiation Corp., known as Arco and located at Walnut Creek, Cal., plans completion of new laboratory, manufacturing, and office facilities this fall.

NEWS

Adam G. Dunn Elected A Director of NPVLA

Adam G. Dunn, founder and president of the Cook and Dunn Paint Corp., Newark, N. J. and associated, in an executive capacity, with a number of other paint industry corporations, was elected for a second term a director of the New York Paint, Varnish & Lacquer Association.

A. G. Dunn

Mr. Dunn, who over a quarter of a century ago founded Cook and Dunn, was one of the pioneers in the do-it-yourself field with his famous slogan of "Painting's Fun with Cook & Dunn."

Mr. Dunn is also chairman of the board of the Thibaut & Walker Co., Inc., a major producer of paint vehicles, executive vice president of AdcO Chemical Co. a manufacturer of varnishes and alkyds, vice president and treasurer of Carbon Dispersions, Inc., producers of black dispersions for paint and ink coatings, and president of Garden State Tung Oil Corp.

•

New Farnow Research Lab

Benjamin Farber, president of Farnow, Inc., Long Island City, N. Y., has announced completion of a large, new research and development laboratory, in line with the firm's over-all expansion program.

The laboratory has been furnished with modern, up-to-date equipment, and space for further extension of these facilities, when needed, has been provided for.

•

Fein's Names N.E. Agent

Fein's Tin Can Co., Inc., subsidiary of U. S. Hoffman Machinery, has appointed Herbert B. Lewis, 30 Huntington Ave., Boston, Mass. as its representative in the New England territory, it was announced by H. E. Martin, general sales manager.

FIRST OF ITS KIND: This is said to be the first high-power magnetostriction type transducer for large scale chemical producing. Designed by Acoustica Associates, Inc., of Glenwood Landing, Long Island, N. Y., this 400 watt, 25 kilocycle transducer can be grouped externally on existing process equipment and driven in tandem by electronic or rotary driven above-audible frequency generators ranging in power from 2000 to 150,000 watts. It can be used with liquids at temperatures for above the boil point, thus overcoming limitations inherent to barium titanate transducers.

Federation Color Forum Highlights Annual Meet

A "Color Measurement Forum"—presenting the case for, and exploring the limitations of color metrics from a paint producer's viewpoint—will be a highlight of the 34 annual meeting of the Federation of Paint and Varnish Production Clubs Oct. 24 in Cincinnati, Ohio.

The panel selected represents a cross section of the finishes industry that has successfully applied color metrics in color development or control. They will discuss their experience with a variety of commercial instruments and techniques.

The panel members and the subjects of their talks will be:

Frank S. Grundy, of Imperial Flo-glaze Paints, Ltd., will serve as moderator and present the *Introduction.*

Dr. Isay Balinkin, of the Department of Physics, University of Cincinnati, *Basic Elements in Color Measurement.*

Mark P. Morse, of E. I. du Pont de Nemours & Co., Inc., *Color Measurement with the General Electric Spectrophotometer.*

Sam J. Huey, of The Sherwin-Williams Co., *Use of Gardner Color Difference Meter for Production Control of Shading Operations.*

Henry A. Tuttle and Melvin M. Gerson, of Ford Motor Co., *An Application of the 'Color master' Differential Colorimeter for Control and Evaluation of Maintenance Paints.*

William C. Parle, of California Ink Co., *Color Measurement with the I.D.L. Color Eye.*

A. J. Bruning, of H. B. Davis Co., *Visual Control of Color (the Davis-Bruning Colorimeter).*

Norman R. Pugh, of Sears, Roebuck & Co., *An Application of the Beckman Model DU Spectrophotometer to Paint Color Control.*

Dr. Balinkin, a noted authority on colorimetry, will present a demonstration lecture. This introduction will outline the aspects of physics, chemistry, physiology, and psychology which are basic to the understanding of color measurement procedures.

A special exhibit of color control equipment and instruments will be open during the regular exhibition hours of the Paint Industries' Show, which will run concurrently with the annual meeting.

•

Stebbins & Roberts Elects

The board of directors of Stebbins & Roberts, Inc., Fort Worth, Texas, and Little Rock, Arkansas have announced the election of Mrs. A. H. Stebbins, Sr., to president. J. Sterling Adamson, executive vice president, will be chief executive officer of the firm.

NEWS

Sherwin-Williams Plans New Plant in Texas

Purchase of a 25 acre tract of land at Garland, Texas, has been announced by the Sherwin-Williams Co., Cleveland.

The company plans to build a new factory, warehouse and distribution center in the Dallas suburb. The site is served by both the Missouri-Kansas-Texas and the Gulf, Colorado and Santa Fe railroads.

While no date has been set for construction to begin, the new installation will replace Sherwin-Williams' present Dallas facilities.

Commenting on the program to expand production and distribution, Arthur W. Steudel, president of the paint firm, pointed out that the expanding economy of the Southwest requires the enlarged facilities.

"Current business in the area is already taking our production capacity there," he said. "The growth of industry has greatly increased demand for all paint products and particularly for those products used in industrial finishing and maintenance. Our new installation will enable us to serve the market with greater efficiency."

•

New Diamonite Agents

Diamonite Products Division, United States Ceramic Tile Co., Ohio, has announced the following appointments as sales representatives for its high-density cylindrical-type Diamonite Grinding Rods for ball and pebble mill grinding of paints, glazes, enamels, chemicals, pharmaceuticals, etc.:

Ducros Co., Inc., Cleveland will handle sale of Diamonite Grinding Rods in western New York, western Pennsylvania and northeastern West Virginia; Fred A. Jensen and Associates, Chicago, will cover Wisconsin, northern Illinois, northern Indiana and eastern Iowa; M. H. Baker Co., Minneapolis will serve in Minnesota, northern Iowa and eastern North Dakota.

Dr. N. Wiederhorn to Speak At N. Y. Vehicle Group Meet

Dr. Norman Wiederhorn, of Arthur D. Little, will speak on "Production Control in Preparing Alkyd Resins" when the Vehicle Group of the New York Paint, Varnish and Lacquer Association begins its fall season on Sept. 12, it was announced by Benjamin Farber, president of Farnow, Inc., and chairman of the Vehicle Group.

Norman Wiederhorn

The paper was co-authored by John Hyre, also of Arthur D. Little.

Dr. Wiederhorn graduated from City College of New York and obtained his advanced degrees in polymer chemistry from Brooklyn Polytechnic Institute in 1948.

Before joining the staff of Arthur D. Little, Inc. in 1954, Dr. Wiederhorn had worked in the resin research laboratories of U. S. Industrial Chemicals on the development of alkyd, phenolic, ester gum and vinyl chloride resins and of ester-type plasticizers. He was later in charge of the physical chemistry laboratories of the United Shoe Machinery Corporation's Research Division.

At Little, Dr. Wiederhorn has participated in projects involving the photopolymerization of divinyl monomers, the development of acrylate emulsions, the physical chemistry of alkyd resins, light scattering techniques and theory, and the development of aerosol analytical equipment.

Mr. Hyre received his Bachelor of Science and Master of Science degrees in chemistry from Ohio University in 1953.

He formerly was employed in the research department of the Paint Div., Pittsburgh Plate Glass Co. He will receive his Ph.D. degree from Harvard University in the near future. Mr. Hyre, with Little, for the past three years, has investigated the oxidation of marine oils, wood degradation products and alkyd resins.

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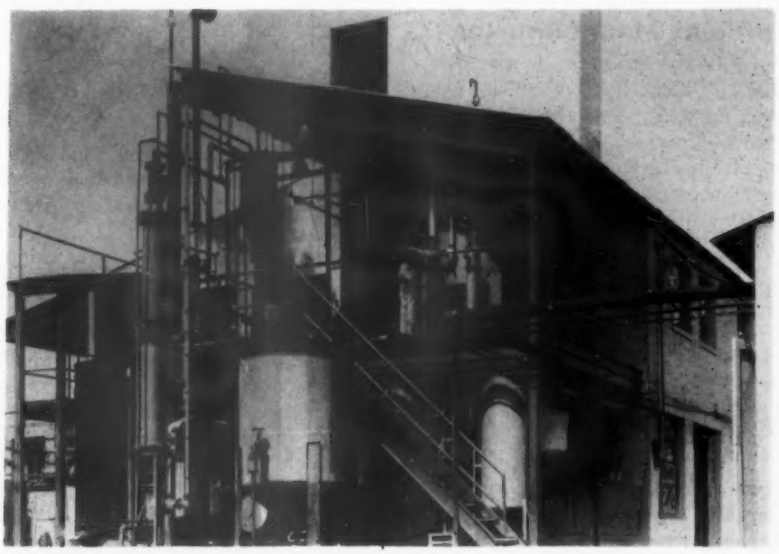
Brown-Allen Appoints

Brown-Allen Chemicals, Inc. has announced the appointment of the Jesse S. Young Company as its exclusive representative for the sale of its Oil Division's line of oils, oil specialties and plasticizers in the New York and metropolitan area.

•

United Wallpaper Votes

Stockholders of United Wallpaper, Inc., have voted in favor of proposals to reclassify the outstanding stock; to acquire certain paint and wallpaper properties of Sears, Roebuck and Co., and to recapitalize the company and reorganize the management, according to a company announcement.



FOR ISOCYANATE MANUFACTURE: Part of the new plant of The Carwin Co., North Haven Connecticut.

NEWS

Dr. Kronstein Visits Paint Groups in Europe

Dr. Max Kronstein, Project Director of the Surface Technology Laboratory, College of Engineering, New York University, has just returned from a four-week tour of Europe where he discussed the industrial problems of a paint and varnish group in West Germany and then visited two of England's most important industrial research laboratories of the paint industry and of the iron and steel industry.

The first was the Paint Research Station at Teddington, Middlesex; the other, the Corrosion Laboratory of the British Iron and Steel Research Association in metropolitan London.

Both research institutes, Dr. Kronstein reported, are fully intry-supported and are well equipped with basic and practical research facilities. The institute at Teddington is headed by Dr. L. A. Jordan and maintains research laboratories in all aspects of varnish and paint chemistry and in all instrumental methods of basic coating research.

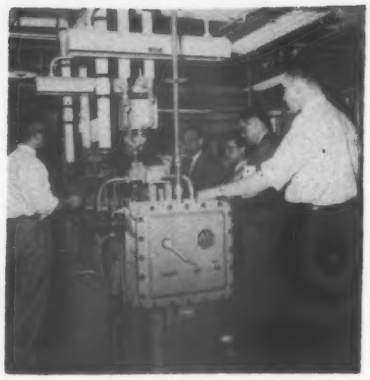
•

Rutgers Lists Courses In Paint Manufacturing

In co-operation with the New York Paint and Varnish Production Club, and the New York Paint, Varnish, and Lacquer Association, the Rutgers Adult Center in Newark is offering this fall two courses in the field of paint manufacture.

These courses are designed for all who are employed in the paint industry—the laboratory, the plant, or the business office, for members of the sales forces of both raw material suppliers and paint manufacturers.

The elementary course, "Fundamentals of Paint Technology," will consider the study of oils, resins, solvents, varnishes, pigments, and a variety of other subjects related to paint manufacture.



Frank La Motta and W. W. Spencer of the Dupont Pigment Division in Newark, N. J. explain the use of the roller mill to William Lawrence's paint technology class. Picture was taken last year on one of the class' field trips.

The advanced course, "Laboratory Techniques and Latest Developments in Paint Technology," will examine the principles and applications of modern instrumental methods of analysis and control of properties of raw materials used in paint manufacture. Technical equipment, such as the spectrophotometer, electron microscope, and the arc spectroscope, will be demonstrated during the field trips to near by laboratories.

Instructor for the courses will be William Lawrence, B.S. in chemical engineering and technical director of Trade Sales Finishes, Flood and Conklin Manufacturing Co., Newark. Guest lecturers, experts in their respective fields, will also participate. Further information is available from the Rutgers Adult Center, 53 Washington St., Newark, N. J.

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Form New Coatings Group In Midland, Mich. Area

A new coatings group, the Midland Coatings Society, has been organized in the Midland, Mich. area.

Its present membership is being drawn principally from The Dow Chemical Co. and Dow-Corning Corp. located in the area. The membership consists of personnel directly or indirectly concerned with the coatings field covering a broad range of interests such as polymer research, application research, technical service, production, market research and sales. Paint, textile, paper maintenance will be among the fields covered in the early programs.

ASTM Pacific Meet to Hear D-1 Report, Symposium

A report on the activities of Committee D- land a symposium on paint are two of the featured attractions of the Second Pacific Area National Neeting and Apparatus Exhibit Sept. 17-21 at the Hotel Statler, Los Angeles, Cal.

The Committee D-l report will be given on Sept. 20. The same day, Thursday, at noon there will be a paint industry luncheon.

The "Symposium on Paint" will be held on Sept. 21. Scheduled for the morning session are the following:

Silicones in the Protective Coatings Industry, H. L. Cahn, General Electric Co.

Surface Treatments for Metals Prior to Painting, A. J. Tuckerman, Bradley Paint Co.

Vinyl Coatings, C. I. Spessard, Bakelite Co.

Protective Coatings for the Railroad Industry, G. J. Grieve, Pacific Paint and Varnish Co.

Scheduled for the afternoon session are the following papers:

Evaluation of Paints and Protective Coatings for Municipal Use, J. H. Rigdon, Los Angeles Bureau of Standards.

Examination and Evaluation of Protective Coatings on Steel in Marine Environments, L. L. Whiteneck, Long Beach Harbor Department.

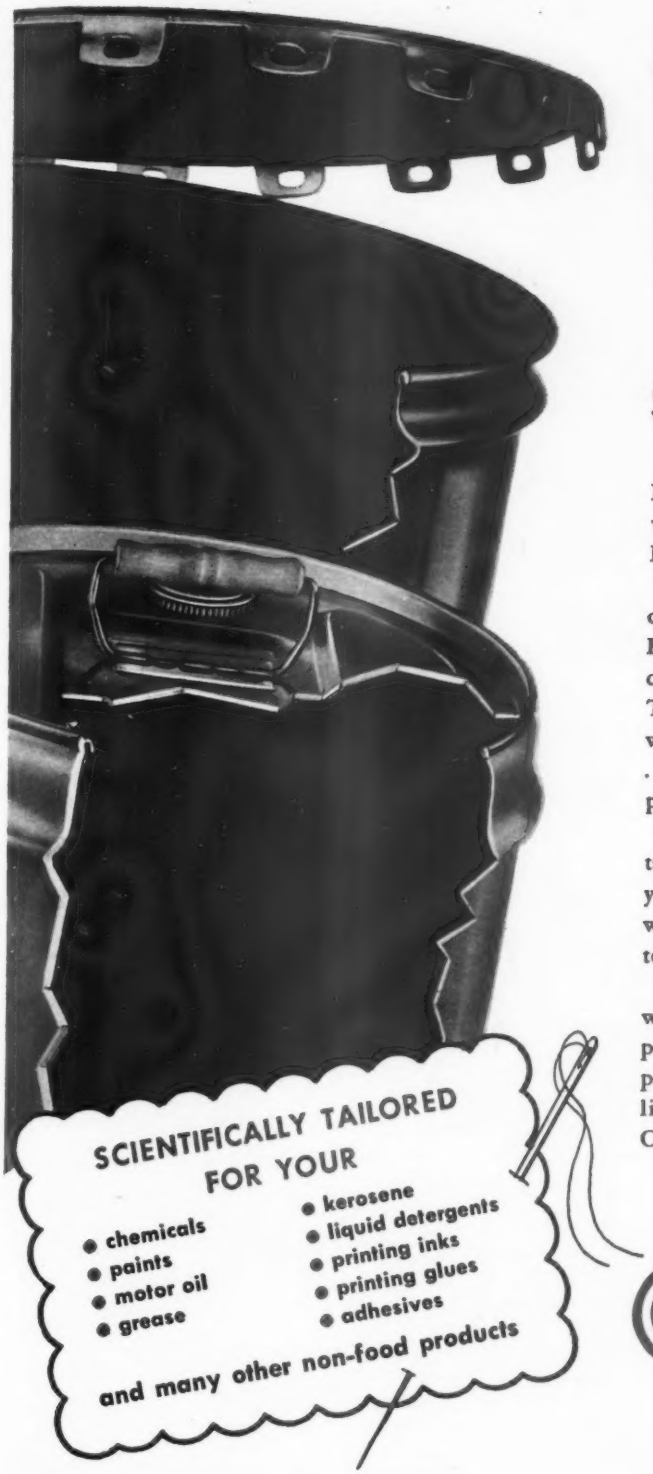
Control of Phosphatizing Systems, S. Spring, Kelite Corp.

Why Paint Specifications?—Their Tests and Controls, C. F. Pickett, Aberdeen Paint and Chemical Laboratory.

A New Optical Parameter for Glare-Reducing Window Coatings, R. D. Hitchcock and W. L. Starr, U. S. Naval Civil Engineering Research and Evaluation Laboratory.

Sponsored by the American Society for Testing Materials, the Coast program will be made up of 43 sessions, 225 technical papers, meetings of ASTM technical committees, plant and laboratory inspection trips, an exhibit of research and testing apparatus, a technical photograph display, and a full program of entertainment for ladies and men.

New protection for hard-to-ship products!



Continental's Perma-LINED steel containers

No matter how difficult your product is to ship, it will travel safe and sure in a Continental Perma-Lined steel container.

Perma-Linings are airless hot-sprayed in the formed container, then fast-baked to a rock-hard finish. Every square-inch of inner surface gets a uniform coat of tough enamel—even at side- and bottom-seams. That's because Continental's airless hot-spray process works exclusively with heat and hydraulic pressure . . . eliminates faulty spray patterns caused by compressed air.

Chances are there is already a Perma-Lined container tailor-made for your individual product. If yours is a "problem product", however, we're ready, willing and able to develop a new Perma-Lining to fit it.

There's a wide variety of Perma-Lined containers waiting to go to work for you: open-top lug cover pails (sizes 2- to 12-gal.) and our 5-gal. tight head pail. For the finest in product protection, exciting lithography and tailor-made service, look into Continental's Perma-Lined steel containers now.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

TAILOR-MADE PACKAGE SERVICE

National Lead Company, Experimental Test Station, Sayville, Long Island, is set up to develop facts on the durability, beauty, and practicability of house paints. In existence since 1917, it now has 2½ miles of test fences, more than 30,000 active tests.

FOOLPROOF

your exterior paints with Dutch Boy® "45X"

(Basic Silicate White Lead)

Chances are you already know that lead gives exterior paints uniform performance. Leading paint makers have agreed on this for years.

But you may not know that Dutch Boy Basic Silicate White Lead "45X" does this with new efficiency, new economy. Thousands of exposure panels at National Lead's Sayville Experimental Test Station prove this.

Take *white* House Paints. "45X", Sayville shows, improves self cleaning yet preserves film integrity.

Take *tinted* House Paints. "45X" helps maintain color uniformity, increases film durability.

Take Primers . . . or Porch and Floor Enamels. When you add Dutch Boy "45X" to your exterior paints, you build up key properties . . . build in *uniform* performance.

Fewer Complaints

Those you hear! Those you don't! Both go down, you'll find. You save time and cost of adjusting complaints. Repeat business comes easier, at less expense.

Cost goes down, too. In each "45X" pigment particle, reactive portion is at the surface . . . making proportionately larger amounts of lead available in each pound.

Fewer complaints! Lower cost! No wonder it pays to put Dutch Boy Basic Silicate White Lead "45X" in your exterior paints.

NATIONAL LEAD COMPANY, 111 Broadway, New York 6, N. Y.
In Canada: **CANADIAN TITANIUM PIGMENTS, LIMITED,** 630 Dorchester Street, West · Montreal

An old hand helps a new product

"LIQUID CARBONIC CO_2 HELPS KEEP OUR PRODUCTION COSTS DOWN . . ."

says W. B. Winkler, Factory Manager,

T. F. WASHBURN COMPANY, Chicago, Illinois

"In producing BURNOK, the thixotropic vehicles which make the revolutionary new dripless paints possible, Red Diamond CO_2 helps us cut costs and serves us in many important ways," reports Mr. Winkler.*

CO_2 Can Help You, Too. This versatile gas is now aiding leading paint manufacturers in more than seven important ways—from cooking to packaging.

Get The Facts And Figures—send for LIQUID's report prepared specially for the paint industry. Photos, diagrams, costs and process details give you the complete story on how CO_2—combined with LIQUID know-how—can be of tremendous advantage in *your* operation. Your complimentary copy is waiting for you. Simply mail the coupon below.

*Trade Mark T. F. Washburn Company

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A fact-filled report on how CO_2 can cut your costs and improve your product. Mail the coupon today.

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Please send me your report on "The Use of CO_2 in Paint, Varnish and Other Alkyd-Type Resin Manufacturing."

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IT'S PERFORMANCE THAT COUNTS!

YOU CAN RELY ON THE PERFORMANCE OF

ODORLESS PHILLIPS 66 SOLTROL*

Count on Phillips, too, for dependable supply and fast deliveries in 4,000 or 8,000 gallon tank cars, or in 6,000 gallon compartment cars containing both Soltrols. Order Soltrol 130 for conventional drying characteristics, Soltrol 170 for longer wet edge.

A trademark

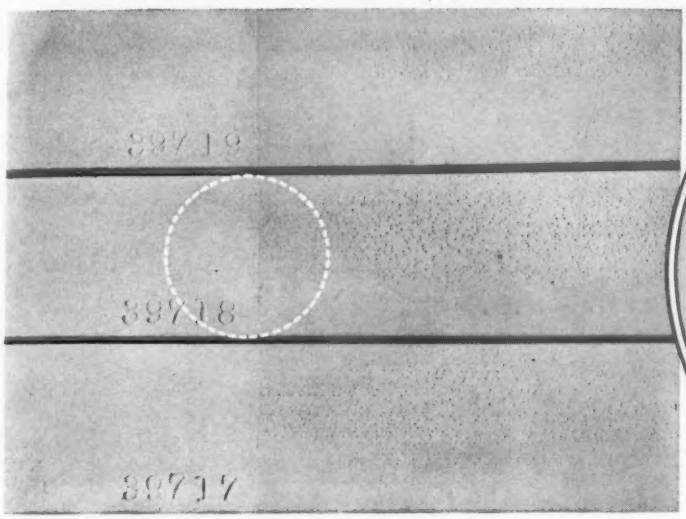
Free Test Samples. We want you to test Soltrol and see for yourself how Soltrol performs in your product. Send for free samples of Phillips *66 odorless* thinners.

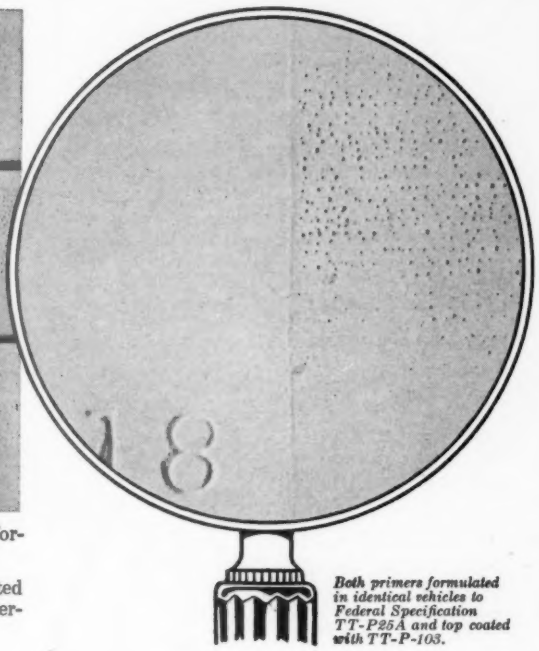
PHILLIPS PETROLEUM COMPANY

Special Products Division

Bartlesville, Oklahoma

Compare the difference in these two paint primers!





Test panels on left show that *no blistering* occurred in the paint primer formulated with Eagle-Picher Super Sublimed White Lead.

Test panels on right show definite *blistering* in the paint primer formulated with an equal volume of a highly reactive lead pigment. Compare the difference in the magnified area on extreme right.

Both primers formulated in identical vehicles to Federal Specification TT-P-25A and top coated with TT-P-103.

EAGLE-PICHER
SUPER SUBLIMED WHITE LEAD
provides greater blister resistance!

Accelerated tests prove that blistering—caused by loss of adhesion when moisture content is high—*does not occur* when quality house paint primers are formulated with Eagle-Picher Super Sublimed White Lead. Even under extremely adverse moisture conditions, these primers show very little water absorption, low volumetric swelling and superior adhesive characteristics.

Insure greater blister resistance in your house paint primers. Specify Eagle-Picher Super Sublimed White Lead. Remember, Eagle-Picher maintains rigid quality control from ore to finished pigment . . . and as the largest producer of *both* zinc and lead pigments provides unequalled and unbiased customer service!

THE FORMULATION

	Pounds per gal.
#41 Super Sublimed White Lead	4.64 lbs.
Titanium Dioxide—Rutile	1.13
Magnesium Silicate	3.41
Raw Linseed Oil	1.32
Z Linseed Oil	2.47
Mineral Spirits	1.62
24% Pb	.06
6% Mn	.03
	14.68 lbs.

PVC—35.5%

Since 1843

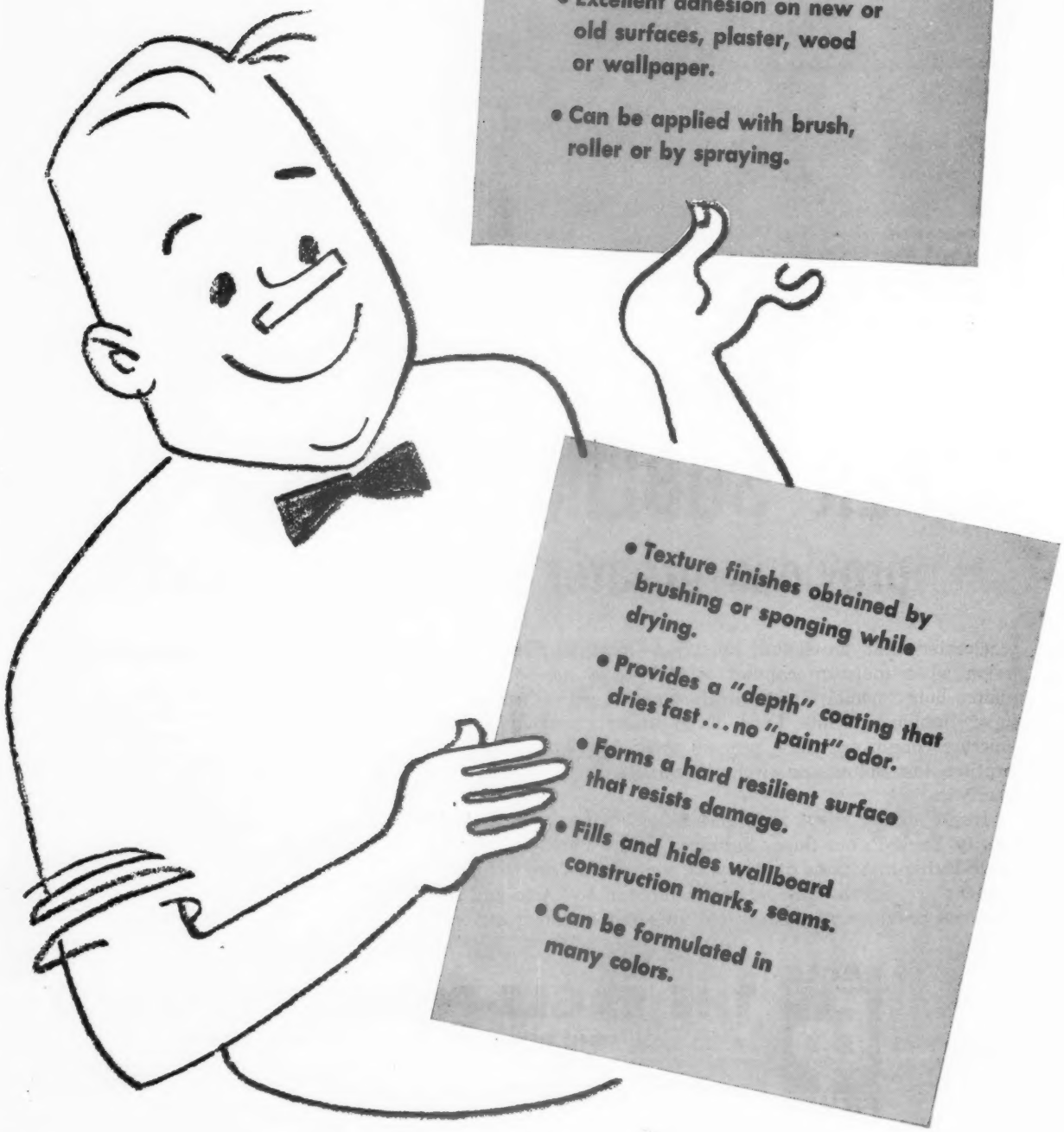
EAGLE EP PICHER

THE EAGLE-PICHER COMPANY

Largest Producer of Both Zinc and Lead Pigments

General Offices: Cincinnati 1, Ohio

Regional Sales Offices: Chicago, Cleveland, Dallas, New York, Philadelphia, Pittsburgh


• Smooth finish with remarkable hiding power—excellent leveling.
• Fast drying... as little as 20 minutes... no "paint" odor.
• Washable—scrubbable when dry.
• Excellent adhesion on new or old surfaces, plaster, wood or wallpaper.
• Can be applied with brush, roller or by spraying.
• Texture finishes obtained by brushing or sponging while drying.
• Provides a "depth" coating that dries fast... no "paint" odor.
• Forms a hard resilient surface that resists damage.
• Fills and hides wallboard construction marks, seams.
• Can be formulated in many colors.

Which list of coating characteristics do you want?

Take your pick... they are both obtainable in formulations based on BAKELITE Polyvinyl Acetate Latex WC-130 ...superior performance that boost sales!

The outstanding qualities of BAKELITE Brand Polyvinyl Acetate Resin Latex WC-130 are in large part responsible for these unusual properties. Why not investigate this business-building polyvinyl acetate latex? Write today for technical bulletins to Dept. RJ-153

BAKELITE Vinyl, Polyethylene, Phenolic, and Epoxy Resins and Styrene and Vinyl Acetate Latexes for Coatings.

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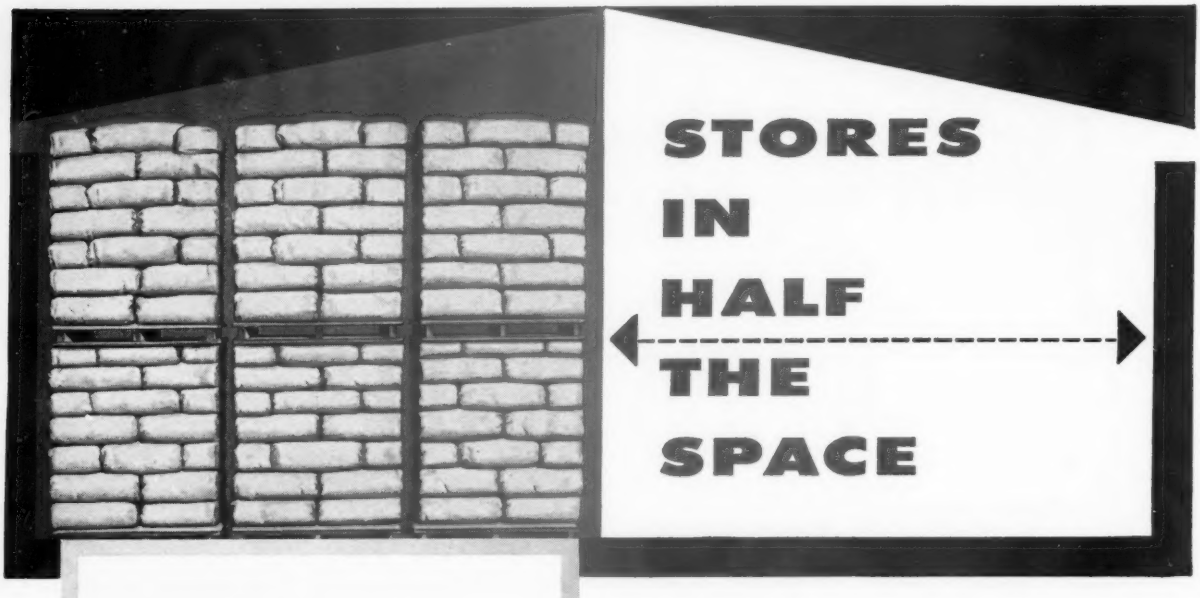
The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

AZODOX

New, Higher Density Zinc Oxide



HERE ARE OTHER IMPORTANT REASONS WHY AZODOX IS BEST FOR YOU

Increased Mixing Capacity. AZODOX incorporates readily in oil, disperses completely. Its high density, low bulk gives greater capacity, steps up production in both mixers and mills.

Physical Properties Unchanged Except for Density. Consistency, particle size and shape, color and all other physical properties of AZO-ZZZ, American Process, paint grade zinc oxides are unaltered. *Apparent density only is changed.* All chemical properties are unchanged.

Flows More Freely, Less Dusting than conventional zinc oxides.

AZODOX Cuts Your Costs. Faster handling, easier storing, quicker mixing save you money.

Samples and test-lots of factory-proved AZODOX now available for you *at the same price of conventional zinc oxides.*

AZODOX is a revolutionary new form of zinc oxide (de-aerated). With twice the density, half the bulk of conventional oxides, AZODOX is the answer to your storage problem. AZODOX comes to you in an easy-to-handle small package, shaped to permit closely packed, unitized shipments. *And the perfect texture of the material remains unchanged.*

AZODOX is available in all grades of American process lead-free zinc oxide.

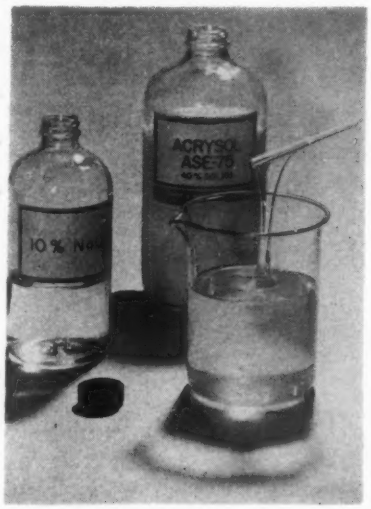
American Zinc sales company

Distributors for
AMERICAN ZINC, LEAD & SMELTING COMPANY
COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.



ROHM & HAAS

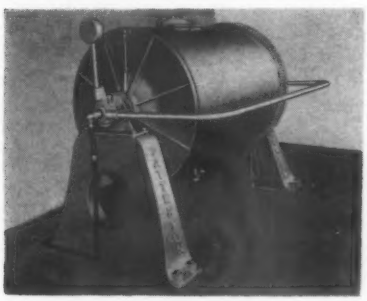
ACRYLIC THICKENER
Converts at Point of Use

A high-solids acrylic thickener and dispersant for aqueous systems offers reduced shipping costs and simplified handling by conversion to a dilute, viscous salt at the point of use, according to the manufacturer.

The new type emulsion, "Acrysol ASE-75," is supplied as a dispersant of 40 per cent solids and low pH. Compared to conventional polyacrylates which are shipped, stored and handled as dilute, viscous salts, product is claimed to offer improved lot-to-lot uniformity and greatly reduced shipping costs (one barrel instead of three). It is also said to eliminate the difficulties of storing and handling viscous liquids or making up solutions from hard-to-dissolve dry powders.

"Acrysol ASE-75," as the sodium, potassium or ammonium salt, is said to be a highly efficient thickening agent (see photo) for latex emulsion paints, natural and synthetic latex compounds, adhesives and other aqueous suspensions. The polymer resists putrefaction and provides viscosity stability on aging over long periods of time.

According to the company, the new emulsion is also expected to find application as a film-forming resin. Pigments are bound very effectively by such films, and the films are highly resistant to change on aging. Rohm & Haas Co., Dept. PVP, Washington Sq., Philadelphia 5, Pa.



PATTERSON

BALL and PEBBLE MILL
Improved Type

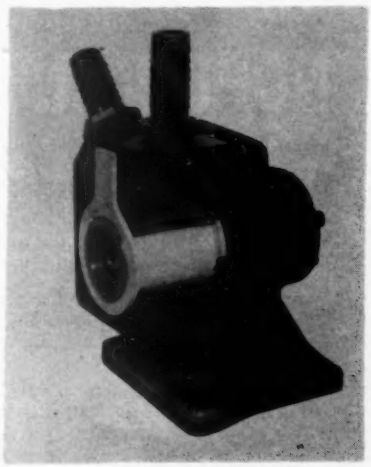
The new "Futura Mill," a radically improved ball and pebble mill, is claimed to establish a new standard of precision and efficiency in fine grinding. Among the advantages claimed are new accurate water temperature control; 20 per cent greater jacket area plus higher water velocity for faster heat transfer than ever before; special corrosion control in water jacket; motor drive integral with mill stand, insuring perfect alignment at all times; heavy duty anti-friction bearing assembly of exclusive design; safety guardrail, counterbalanced for easy operation and interconnected with motor circuit. Further information is available in Brochure No. B-562. The Patterson Foundry and Machine Co., Dept. PVP, East Liverpool, Ohio.

KOJIC ACID DERIVATIVES
Paint Additives

Kojic acid derivatives, chlorokojic acid and kojyl palmitiate are available in experimental quantities.

Chlorokojic acid is a stable intermediate which, according to the manufacturer, may be useful as a route to compounds which cannot be formed directly from the parent kojic acid. The fungicidal properties of certain metal chelates of chlorokojic acid suggest their use as mildewcides and fungicides in paints.

Kojyl plamitiate has potential uses in the removal of trace metals from nonaqueous media such as petroleum oils and paint additives and yet maintain its chelating properties in such systems, the manufacturer claims. For complete data on these compounds contact Chemical Sales Div., Chas. Pfizer & Co., Inc., Dept. PVP, 630 Flushing Ave., Brooklyn 6, N. Y.



VANTON

ELASTOMER PUMP LINER
Resists Chemicals and Heat

A Kel-F elastomer liner for use with the company's pumps is said to permit the pumping of highly corrosive products under severe conditions. These highly corrosive products, which heretofore could

not be handled with existing materials, are now made routine because of the liner's unusual chemical resistance, according to the company.

Proper selection of a pump body block, along with a Kel-F elastomer flexible liner, affords exceptional resistance to aliphatic solvents, some chlorinated solvents, etc. Liners are currently available, in all pumps, in capacities from 1/3 to 5 GPM. Vanton Pump & Equipment Corp., Dept. PVP, 201 Sweetland Ave., Hillside, N. J.

BARREL TRUCK
Aluminum Type

The "Ezy-Rol Barrel Cart," an all aluminum barrel truck equipped with two-wheel safety brakes, is said to be valuable for use in delivery service or wherever it must be lifted by the operator.

Two-wheel safety brakes are claimed to give the operator complete control of loads as heavy as 1000 pounds when moving down ramps or steep inclines. "Non-sparking" aluminum construction is said to make the cart ideal for use in plants were volatile materials are present as it eliminates the possibility of sparks between the truck and steel drums being handled. Pallet loading of drums is said to be easily accomplished with this cart while a spring actuated hook speeds all barrel handling operations. Valley Craft Products, Inc., Dept. PVP, 750 Jefferson Ave., Lake City, Minn.

VALLEY CRAFT

MONITOR
Electronic Type

The "Electric Indexometer" or monitor now makes it possible to tell what kind of gas, fluid or material is flowing through a pipeline without drawing off a sample, according to the company. The monitor can be used in on product lines, in-line mixing, batch mixing, fractionation, etc.

The unit measures the index of refraction and indicates it on a wide scale meter at the point of operation and at distance of several miles, if necessary. It operates under any pressure or temperature; on liquids that are opaque, clear, or translucent, reflective or non-reflective; with or without suspended solids, water or entrained air; and on gases. According to company, it can be calibrated to show a range of refraction indices or "zero center" on a single index and show plus or minus deviations from this; does not interfere with or contaminate the process it monitors; can be inserted in the wall or a bypass of the wall of a pipe tank, or process plant; can be made explosion-proof, operates at 1500 psi, and requires no more power than a small electric lamp. Industrial Gauges, Dept. PVP, 42 Grand Ave., W. Englewood, N. J.

cost conscious?

If high raw materials costs cause you sleepless nights, don't send for barbiturates; send for a Velsicol Representative. He will explain how manufacturers of paints, coating vehicles, and curing compounds have cut raw materials and solvents costs with Velsicol Hydrocarbon Resins. He can supply samples for use in your evaluation program, and assist you with technical services now available through the Velsicol Resin Laboratories. Contact him soon. You won't be obligated, and you'll probably find the answer you're looking for.

MAIL THIS COUPON FOR FREE TECHNICAL LITERATURE!

VELSICOL

try Velsicol hydrocarbon resins

Look for this man!

...your Velsicol Representative, a qualified chemist who can show you how to make better paints and coating vehicles at lower cost with Velsicol Hydrocarbon Resins.

VELSICOL CHEMICAL CORPORATION
330 East Grand Ave., Chicago 11, Illinois Dept. 58

Gentlemen:

☐ Please send me your Technical Bulletins No. 203 and 219.
☐ Please send me samples of Velsicol Resins.

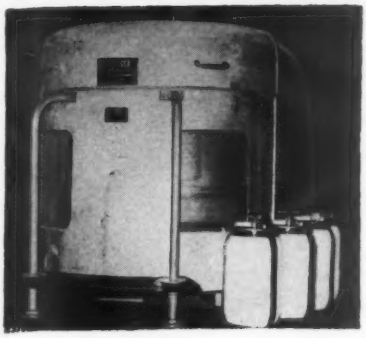
NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

NEW MATERIALS — EQUIPMENT



KINETIC

BALL MILLS
Utilizes Centrifugal Force

Company says it is introducing in this country a new development in ball mills for extremely fine particle size reduction and rapid ball mill grinding dispersion. These mills are designed to take advantage of a principle new in production—the application of higher centrifugal force to ball and pebble mill grinding by planetary motion of the ball mill pots.

These "Steel-Shaw" mills, manufactured by the firm of Steel and Cowlishaw Ltd., England, are said to have demonstrated production of a grind in four hours that requires 40 hours in a conventional ball mill. They are made in both a production and a laboratory model. The mills are said to work well with all types of coating formulations that normally require ball mill grinds. They will grind to semi-paste consistencies, and they will grind dry materials.

Through its subsidiary, Kady International Corp., The Kinetic Dispersion Corp., Dept. PVP, 95 Botsford Pl., Buffalo 16, N. Y., manufacturers of the "Kady" mill, has imported these mills and will manufacture them in this country under license.

FATTY ALCOHOL
Color-Stable

"Adol 42" is a straight chain, unsaturated, monohydric fatty alcohol derived from animal fats. It consists primarily of cetyl, stearyl and oleyl.

At room temperature, it is a waxy-white product, soft to the touch, with a mild fatty odor. It is uniform, color-stable, non-corrosive and can be readily sulfated and emulsified, according to the company. It is said to be soluble in most solvents.

Among the suggested uses for this new fatty alcohol are resins, and chemical intermediates. Archer-Daniels-Midland Co., Chemical Products Div., Dept. PVP, 2191 W. 110 St., Cleveland 2, Ohio.

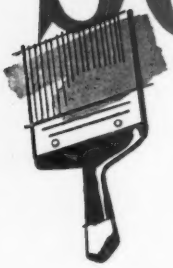
STENCILING METHOD
For Drums

Company claims to have developed an ink suitable for marking on metal—to be used with the "Rol-It-On" roller process stenciling system. The new "Rol-It-On" non-porous marking ink, which is available in colors, has excellent covering power and dries instantly, according to the company. It can be used for marking on metal or on any non-porous surface. Diagraph-Bradley Industries, Inc., Dept. PVP, P.O. Box 269, Herrin, Ill.

DIAGRAPH

Better odorless paints start with

SOVASOL 35



. . . Meets the top standards for the industry!

SOVASOL 35 is an isoparaffinic of the "odorless mineral spirit" class. Its excellent odor characteristics and unusual ability to give false body in paint formulations make it ideal for use in interior protective coatings.

SOVASOL 35 is widely used in the formulation of odorless alkyd-type flats, semi-gloss and certain enamel-type interior paints for trade sales goods, where odorless paint is desired.

It is water white in color and passes all pertinent stability and copper corrosion tests. It is practically odorless, is doctor sweet and is relatively color stable.

For complete information about *Sovasol 35*—and how it can improve *your* products—call your Socony Mobil representative, or write the address below.

SOCONY MOBIL

OIL COMPANY, INC.

26 BROADWAY, NEW YORK 4, N. Y.

Hudson Red Light

NEW ADDITION TO OUR LINE OF DEPENDABLE RED PIGMENTS

HUDSON RED LIGHT IN VINYL PLASTICS AND RUBBER

Excellent ease of dispersion
Excellent heat resistance
Excellent resistance to migration and crocking
Non-bleeding in water, dioctylphthalate, tricresyl phosphate
Fair to good fastness to light

HUDSON RED LIGHT IN LITHOGRAPHIC, TYPOGRAPHIC, INTAGLIO INKS (TIN PRINTING AND FOOD WRAPPERS)

Excellent softness of grinding
Good baking resistance
Non-bleeding in brine, hydrocarbon solvents, alcohol
Resistant to bleeding in paraffin, fats, greases
Fair resistance to soap
Good fastness to light in fullshade and tint

HUDSON RED LIGHT IN PAINTS

Excellent ease of dispersion
Non-bleeding in linseed oil and mineral spirits
Excellent resistance to acid
Fair resistance to alkali
Good fastness to light

We invite you to investigate the advantages of Hudson Red Light over competitive products—such as softness in grinding and fastness to light. In addition to its high tinctorial value, Hudson Red Light passes 100% through a 325 mesh sieve.

Make a practical plant trial of the dependability of Hudson Red Light for your own uses. Kindly call upon the services of our Technical Department—or our nearest sales office.

From Research to Reality

gdc

GENERAL DYESTUFF COMPANY

A SALES DIVISION OF
GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14 • NEW YORK

BOSTON • CHARLOTTE • CHATTANOOGA • CHICAGO • LOS ANGELES • NEW YORK • PHILADELPHIA • PORTLAND, ORE. • PROVIDENCE • SAN FRANCISCO • IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA, LTD., MONTREAL

Announcing! Increased plant capacity on

Oronite PHTHALIC ANHYDRIDE *plus*

new, large storage terminals at key national consuming points

Oronite was the original producer of phthalic anhydride from ortho-xylene, a petroleum derivative. Having complete control of the basic raw material, you are always assured of Oronite as a dependable source of supply.

With increasing demands for Oronite PA, manufacturing facilities have been greatly enlarged to assure you product when you need it. And to further provide you quick delivery of phthalic anhydride in molten or flake form, Oronite has set up bulk storage terminals in close-by Eastern centers. Carload prices are obtainable in mixed carloads of phthalic anhydride, maleic anhydride and new isophthalic.

Why not get Oronite's new, up to the minute story on phthalic anhydride? Call or write the nearest Oronite office.

"Basic Chemicals for Industry"

ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES: 200 Bush Street, San Francisco 20, California

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Mercantile Securities Building, Dallas 1, Texas 450 Mission Street, San Francisco 5, Calif.
36 Avenue William-Favre, Geneva, Switzerland

ORONITE CHEMICAL COMPANY

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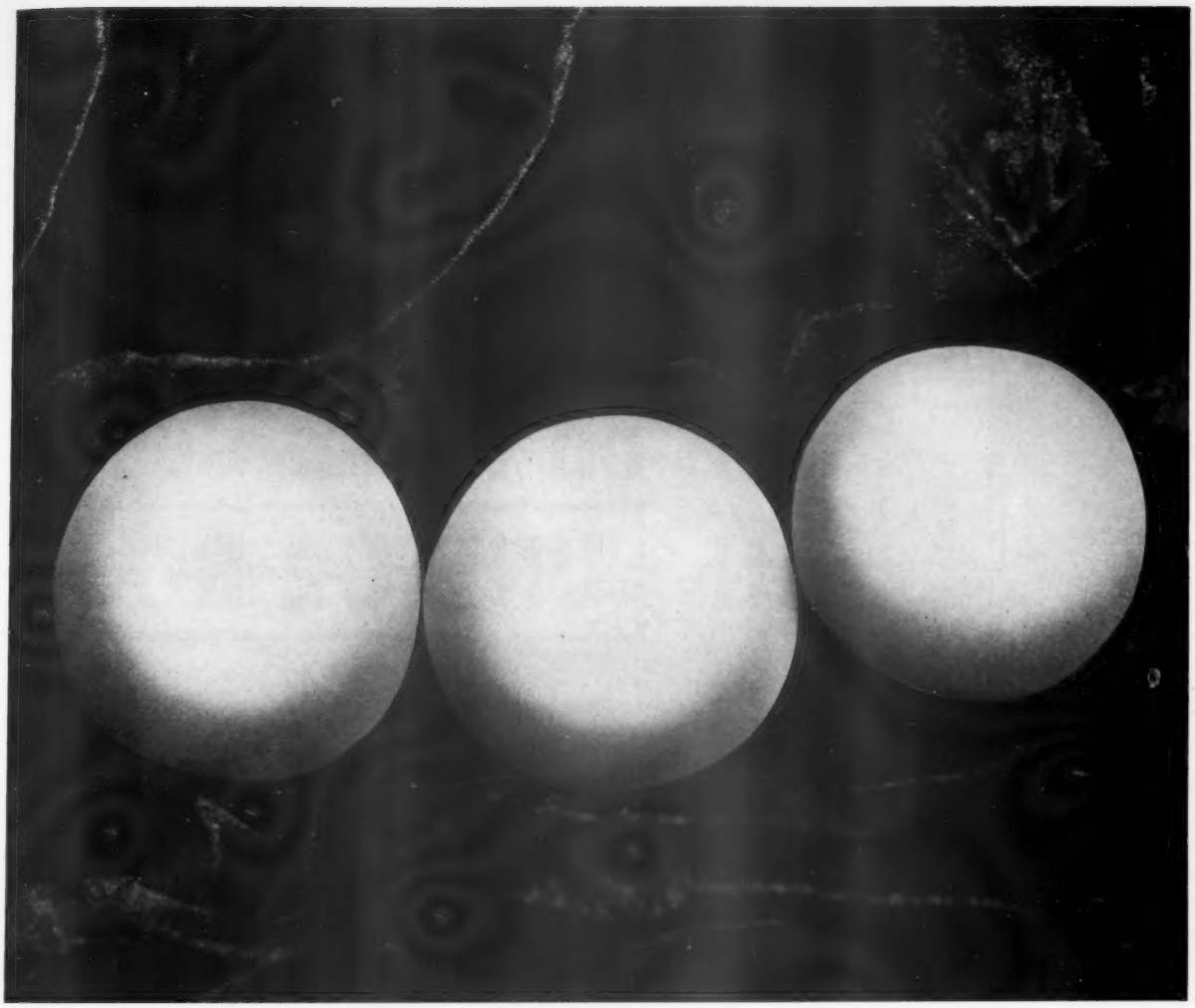


McDANEL NEW IMPROVED HIGH DENSITY GRINDING BALLS WEAR LONGER—GRIND FASTER

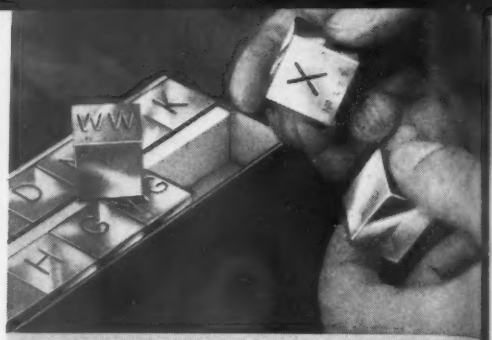
Improved manufacturing procedures and higher firing temperatures make the New McDanel Super High Density Grinding Ball even better than before! You get a superior grinding ball that retains its shape and lasts much longer. Complete vitrification gives extra toughness, less pickup and contamination and greater mill economy. 2½", 2", 1¾", 1½", 1¼", 1", ¾" and ½" sizes. 3" size on request. Change to New McDanel Super High Density Grinding Balls today. You'll begin to realize more profit and economy from your present mills if you do.

McDANEL Industrial CERAMICS

McDANEL
REFRACTORY PORCELAIN COMPANY
BEAVER FALLS · PENNSYLVANIA

Send for Bulletin B1-56 today. Get the facts on better ball mill grinding.

Using titration apparatus, technician checks acid value of UNITOL ROS.



UNITOL ROS is consistently pale in color. Typically lighter than color standard "X"

Save on Rosin Costs with UNITOL ROS

You can save substantially on rosin costs with Union's *UNITOL ROS*. This new tall oil rosin is a pine wood derivative obtained in the Kraft paper manufacturing process. It is low in cost, uniform in quality and, because there is no captive consumption, you are assured of constant supply.

In chemical and physical characteristics, *UNITOL ROS* compares favorably with gum and wood rosin. Typical analyses show a color paler than "X" and a softening point (Ring and Ball) of 85° C.

These factors, coupled with the competitive advantage of lower price, indicate that *UNITOL ROS* should have a valuable place in your manufacturing operation.

Write for samples and additional information.

A COMPLETE RANGE OF TALL OIL PRODUCTS

Union Bag-Camp is the only single source for:

Refined Tall Oil	Tall Oil Fatty Acids	Crude Tall Oil
Tall Oil Rosin	Distilled Tall Oils	Tall Oil Pitch

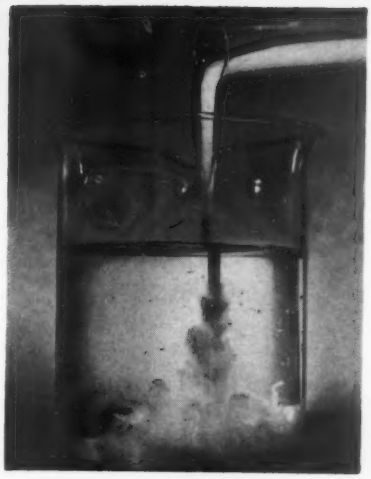
unitol — TALL OIL union camp PRODUCTS

Chemical Sales Division

UNION BAG-CAMP PAPER Corporation

233 BROADWAY, NEW YORK 7, N. Y.

N E W
MATERIALS — EQUIPMENT



DOW CORNING

SILICONE DEFOAMER
Resistant to Heat and Cold

"Antifoam B," said to be a new faster-acting, more stable silicone defoamer useful in a wide variety of applications, is generally effective at concentrations in the range of 3 to 30 parts per million.

Said to be instantly dispersible in aqueous systems, product may be added "as is" without stirring or agitation. Because it has extremely small particle size, it also said to stay in suspension longer. Ideal for continuous processing, it will not oil out, plate out, settle or precipitate in most applications, according to the company. Resistant to heat or cold, product is claimed to retain its effectiveness even after being literally frozen or boiled. This means that it is effective during thermal sterilization, and that storage problems are reduced to a minimum. Dow Corning Corp., Dept. PVP, 592 Saginaw Rd., Midland, Mich.

PVAc EMULSION
Fine Particle Size

EK-222 is a polyvinyl acetate emulsion of the free-filming type which, according to the manufacturer, has the following attributes for paint formulation: does not oxidize or discolor, compatible to most surfaces with good leveling, sufficiently water permeable to permit application over moist surfaces, sufficient alkali resistance to permit application over new plaster, fast drying, odor free, shows no lap marks and grease resistance. Emulsion EK-222 has total solids of 52-55%, viscosity 1500-2500 cps, particle size of 0.5 - 1 micron, pH 4.5-5.5, and is anionic. Available in 5 gallons to carlots. Paisley Products, Inc., Dept. PVP, 630 W. 51st St., New York 19, N. Y.

METHYL LINOLEATES
Safflower Oil Based

Safflower oil is the basis for the new, highly versatile, low-cost Methyl Linoleates now being offered to alkyd and polymer manufacturers by the company. They have been developed to fill the need for a product without the limitation on choice of polyhydric alcohol normally imposed by the use of the whole oil. Thus, company says, the advantages of Safflower acids and pentaerithritol can be combined.

The new series of products—Methyl Linoleate (ML), Bleached Methyl Linoleate (MLB), and Conjugated Methyl Linoleate (ML22) are high in linoleic esters, low in saturated fatty acid content with little or no yellowing linolenic esters. They can be used with slight modification in place of existing raw materials because of their similar characteristics. Pacific Vegetable Corp., Dept. PVP, 62 Townsend St., San Francisco, Cal.

NEWS

Schenectady Varnish Establishes Electrical Lab

Establishment of a new electrical testing and development laboratory has been announced by the Schenectady Varnish Co., Inc., of Schenectady, N. Y.

According to J. W. McHugh, vice president, the new laboratory is the direct result of increasing demands by the electrical industry for wire enamel and insulating varnish systems capable of long time operation at Class B temperatures of 135° C.

Through the use of modern high temperature testing devices in this laboratory, it is expected that reliable accelerated aging data can be obtained on new Class B resins and varnishes, as they are developed in the company's existing research and development facilities. This data should help reduce the amount of similar testing which wire and electrical equipment manufacturers must do to properly evaluate such products.

Mr. McHugh stressed the fact that the increase in temperature requirements for electrical insulation systems from the Class A level of 105° C to the Class B level of 135° C had essentially made all Class A insulating materials obsolete. The extensive performance data and testing methods developed and used for Class A materials by the electrical industry over a number of years, is of little or no value in the evaluation of materials intended for operation at Class B temperatures.

A completely new technology must be built up for Class B materials, he stated. This need is complicated by the urgency of the demands for reliable materials capable of indefinite operation at 135° C. He illustrated this by citing the guided missile, supersonic aircraft and miniaturization programs of the country's defense forces, as well as the demands upon electrical equipment manufacturers to develop and produce smaller, lighter, commercial units capable of higher output.

Mr. McHugh then pointed out that most of the data developed in the laboratory would be obtained on test equipment operating at 150 or 200° C. This makes it possible to determine the expected life of a Class B varnish or wire enamel in 4-6 months. If run at normal operating temperatures, it might take 30 years or more to determine the life of such a product, he asserted.

•

Glidden Dissolves E. W. Colledge G.S.A. Inc.

The Glidden Company has dissolved the corporate entity of its wholly owned subsidiary, E. W. Colledge G.S.A. Inc., and consolidated its activities with those of Glidden's Southern Chemical Division.

Announcement of the consolidation was made by Paul E. Sprague, vice president in charge of the Southern Chemical Division. He said operations will be continued from the former Colledge offices in Jacksonville, New York, Cleveland, Chicago, and San Francisco.

The Colledge firm was organized in 1926 and for 30 years was the sole sales agent for products manufactured from destructively distilled wood by the American Turpentine and Tar Co., New Orleans, and by Glidden's former Naval Stores Division (now Southern Chemical). The New Orleans company ceased operations last year.

Mr. Sprague stated that all employees of the Colledge organization are being retained, with full rights of seniority and employee benefits under Glidden's pension and insurance plans for employees.

•

Benzoic-Toluic Plant

A contract for the construction of a benzoic-toluic plant at the Richmond refinery of Standard Oil Company of California was awarded to Fluor Maintenance, Inc., of Martinez, Cal., Standard officials recently announced.

Benzoic-toluic will be marketed by Oronite Chemical Co., a Standard subsidiary, in conjunction with Oronite isophthalic as a modifier of alkyd resins to improve properties of paints, enamels and other surface coating. The plant is tentatively scheduled for completion late this year.

THE PROOF OF THE PAINT...*IS IN THE FINISH*

GIVE IT

MILDEW-RESISTANCE

The damaging effects of mildew are now checked by Super Ad-It® in the oil paint formulations of hundreds of manufacturers. In long-time, actual use, this Nuodex Additive has proved its effectiveness. More than this—the longer-lasting, cleaner-looking finish assured by Super Ad-It guards *the good name* of your paints over the counter and on the job.

Super Ad-It (di [phenyl mercury] dodecenyl succinate) was developed by Nuodex specifically to meet the problem of *exterior* paint mildew. This was only the beginning of research by Nuodex into every phase of the mildew problem—in water, oil, alkyd and oleoresinous paints.

The characteristics of your paints and their unique conditions of application might very well demand a specialized fungicide. Our Technical Staff will gladly help you choose the one to meet your requirements—from the Nuodex line of mercurials, metallo-organics and organics.

• • •

Mildewcides are only one group of Nuodex Additives—additives that have application throughout the paint industry. We invite the opportunity to engage in cooperative research with you on any of your paint formulation problems. Kindly contact your Nuodex Representative or write us direct.

NUODEX ADDITIVES

NUODEX PRODUCTS COMPANY...342 MADISON AVENUE, NEW YORK 17, N. Y.

A Division of Heyden Chemical Corporation

NEWS

Two Surface Technology Courses Offered by N.Y.U.

Two surface technology courses will be offered during the 1956 fall semester at New York University's Division of General Education, Dean Paul A. McGhee has announced. The courses are part of the Division's Program of Technical Studies.

"Fundamentals of Paint, Varnish, and Lacquer Technology" will meet on Wednesday evenings. Among the topics to be covered are coatings for protection, decoration, and functional purposes; raw materials used in organic coating; manufacture of organic finishes; testing methods. Instructing will be Dr. Myron A. Coler, consulting engineer, and technical director of the Markite Co., New York, and Elias Singer, technical director of the Troy Chemical Co., New York.

A seminar in "New Developments in Organic Finishes" will meet on Tuesday evenings. The course is concerned with recent developments in high polymer chemistry and the requirements for finishes set forth by the armed forces. Dr. Coler, Mr. Singer, and Sidney Lauren, chemist in the finishes section of the Johns Manville Research Center, Manville, N. J., will instruct.

Those interested may register by mail or in person from September 10-28. Further information can be obtained from the Division of General Education, New York University, 1 Washington Square North, New York 3, N. Y.

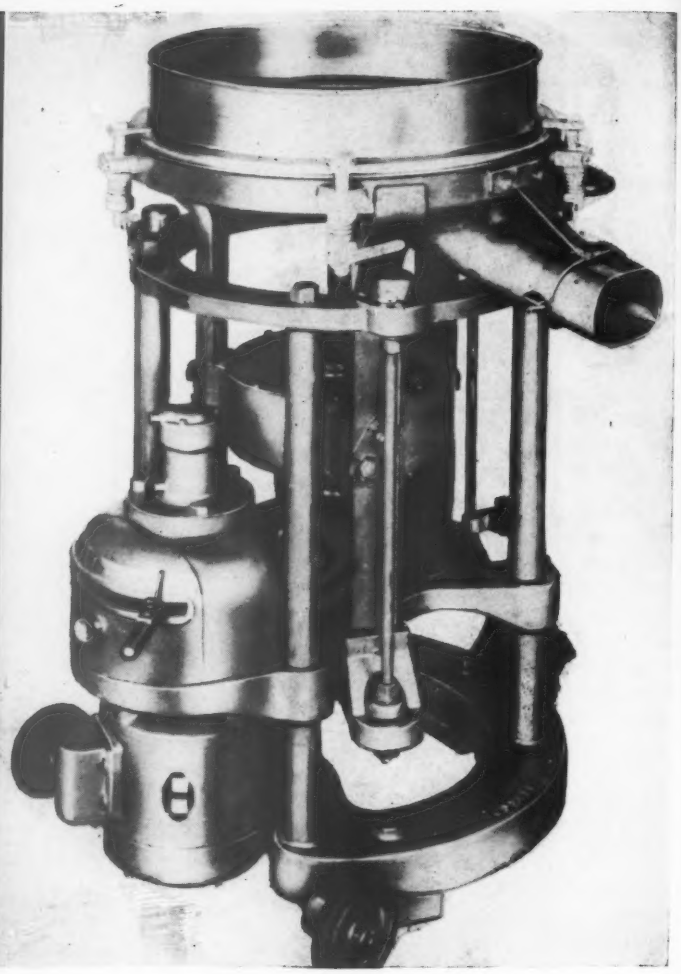
•

NBS to be Relocated

A tract of approximately 550 acres of land near Gaithersburg, Md. has been selected for relocation of the Washington laboratories of the National Bureau of Standards. The move will permit the Bureau to plan new buildings to replace present research facilities, which over the past 50 years have become inadequate for current needs.

GROUND BREAKING: Construction recently started on the new 42,000 square foot plant for Minnesota Paints, Inc. at Dallas, Texas. To be completed by December, the plant will produce a full line of home and industrial paints and finishes for the growing number of Minnesota dealers in Texas, Oklahoma, New Mexico, Arkansas and Louisiana. In addition to streamlined paint production facilities, the Minnesota Paints plant will contain modern laboratories plus warehouse and regional office facilities.

"FINEX" VARIABLE SPEED PAINT SCREENING MACHINES



multiply throughputs of paints and enamels

Do you know that you can now speed up paint screening substantially? The "Finex" Variable Speed Paint Screening Machine recently introduced to the United States by this Company, has notable features that should interest you from a cost-saving standpoint.

This small machine has an exceptionally high through-put rate and the screen is practically "non-blinding". It is certainly a tough screening paint that cannot be processed at better than 500 gallons per hour through a 150 mesh screen. Most flats and latex paints can be screened at from 800 to 1100 gallons per hour. When required, screens upward of 250 mesh can be used.

Another feature is the fast clean-up from one batch to another. Toggles placed on the screening head quickly release the circular rim and screen for rapid, easy cleaning. All surfaces are round and smooth.

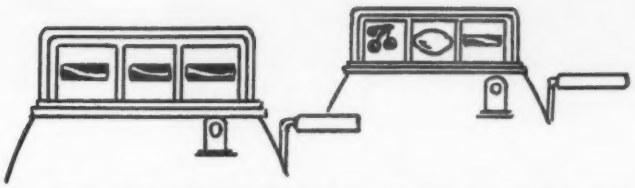
The Finex Screening Machine has casters for easy moving from one location to another, permitting further flexibility of operation. This machine will save you money in many ways.

Our Test and Engineering facilities are at your disposal.
Write for full details.

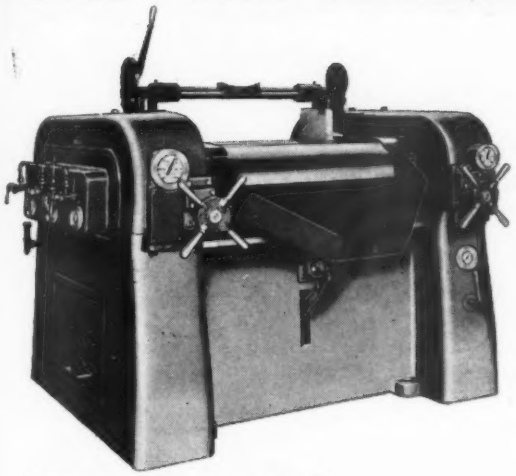
LEHMANN

J. M. LEHMANN COMPANY, Inc.

MAIN OFFICE AND FACTORY: 558 NEW YORK AVE., LYNDHURST, N. J.



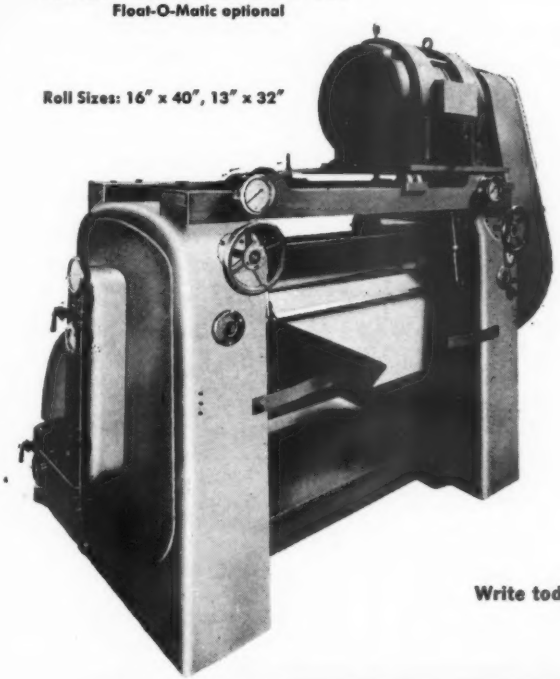
ONLY ONE COMBINATION REALLY PAYS OFF



Roll Sizes: 16" x 40", 13" x 32", 9" x 24"
Float-O-Matic optional

...IN LOW COST PAINT MILLING, TOO!

Roll Sizes: 16" x 40", 13" x 32"



It's no gamble when you choose the Lehmann high production economy pair of Three Roll Paint Mills to help you increase your production profits. Together the 631-V Vertical Mill for large batch, high production work and the 662-V Horizontal Mill for small batch production, reduce paint milling costs more than any other combination of mills . . . providing more profits to plants large or small.

Both of these mills are equipped with Lehmann's exclusive *threefold* Sight-O-Matic* gauge control over (1) dispersion, (2) take-off efficiency, (3) product temperature. All adjustments are simpler, faster, more accurate.

Lehmann is also equipped to offer milling research service on samples of your formulations, without obligation, and Certified Factory Reconditioning Service on any of your present mills.

Write today for further details on any of Lehmann's machines or services.

*Reg. U. S. Pat. Off.

LEHMANN®

J. M. LEHMANN COMPANY, Inc.

COAST-TO-COAST SERVICE

Moore Dry Dock Company
Oakland, California

Lammert & Mann Co.
Chicago 12, Illinois

J. M. Lehmann Co., Inc.
Lyndhurst, New Jersey

CALENDAR OF EVENTS

Sept. 16-21. American Chemical Society Meeting, Atlantic City, N. J.

Sept. 24-26. American Oil Chemists' Society Fall Meeting, Sherman Hotel, Chicago, Ill.

Oct. 22-24. 34th Annual Meeting of Federation of Paint and Varnish Production Clubs and 21st Paint Industries' Show, Netherland-Plaza Hotel, Cincinnati, Ohio.

Nov. 12-14. 68th Convention of National Paint, Varnish and Lacquer Assoc., Statler Hotel, Los Angeles, Calif.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmilers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 1st Thursday after 2nd Monday, Melrose Hotel.

Detroit, 4th Tuesday, Rachham Building.

Golden Gate, 3rd Monday, E. Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Bill Williams Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

New England, 3rd Thursday, University Club, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Philadelphia Rifle Club.

Pittsburgh, 1st Monday, Gateway Plaza, Bldg. 2.

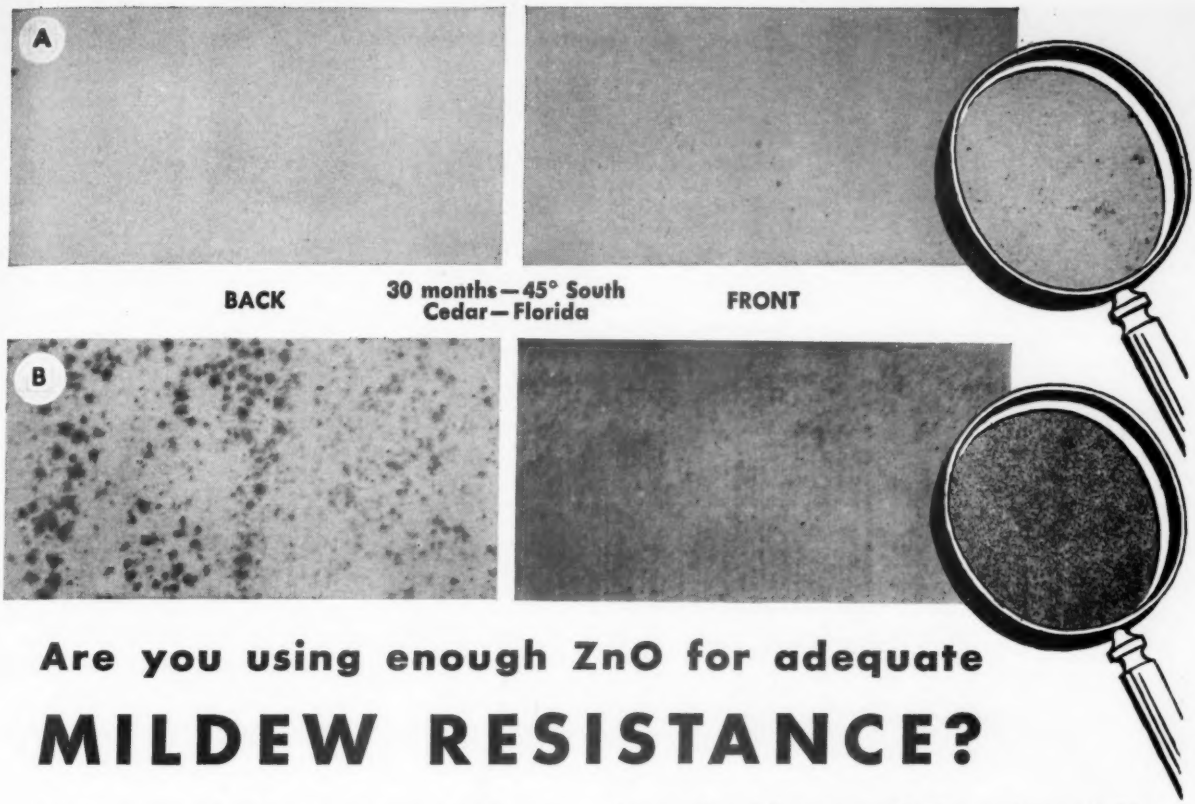
Rocky Mountain, 2nd Wednesday.

St. Louis, 3rd Tuesday, Kings-Way Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Oak Room, Union Station.

Western New York, 1st Monday 40-8 Club, Buffalo.



Are you using enough ZnO for adequate

MILDEW RESISTANCE?

The cedar panels above are coated with conventional (linseed oil vehicle) exterior paints. The only difference: the zinc oxide content in the pigment of paint B has been reduced 44.5% ... from 2.7 to 1.5 pounds per gallon.

The result? Panel A is not seriously affected by mildew after 30 months exposure. Panel B shows extreme mildew deterioration — too little Zinc Oxide to meet specific local conditions.

The qualities which are imparted to any good paint by adequate quantities of zinc oxide are well known ... and time-proved. But, in balancing a formulation, zinc oxide levels may be cut too far for customer satisfaction. With this in mind, consider:

Are you formulating your paints for maximum possible quality?

Are you formulating your paints with enough zinc oxide?

ENOUGH ZINC OXIDE GIVES YOUR PAINT...

- **Mildew resistance**
- Durability
- Opacity to ultra-violet light
- Tint retention
- Self-cleaning action

Technical reports are now being prepared by member laboratories of AZI on the benefits of proper zinc oxide usage. To receive copies of these reports, mail coupon.

AZI

AMERICAN ZINC INSTITUTE, INC., Dept. B
60 East 42nd Street, New York 17, N. Y.

Please send me future reports on paint formulation findings.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

PERSONNEL CHANGES

DU PONT

Cyril J. "Cy" McKeown, formerly of the Philadelphia sales office, has been appointed industrial sales representative, replacing **K. E. Western**, who is transferring to St. Louis. Mr. Western will headquarter in Kansas City.

Mr. McKeown joined the company at the Marshall Laboratory in 1941. Following military service, he returned to the laboratory in 1945, transferring to finishes sales in 1952.

HOLLAND COLOR & CHEMICAL

Jerome E. Counihan has been appointed sales manager, according to an announcement by C. R. Trueblood, president and general manager.

J. E. Counihan

A graduate of chemistry from High Point College, he served in the Army of Occupation in Japan, as Operations Sergeant in the Technical Intelligence Section of G-2. He will make his headquarters at the company's plant in Holland, Mich. Mr. Counihan was formerly with the Pigments Division, American Cyanamid Co.

N. D. Warriner

C. R. Mercer

BRANDRAM-HENDERSON LTD.

C. R. Mercer, has been appointed director of technical services, it was announced by V. H. Vedda, vice president, production and research.

In his new position, Mr. Mercer will be in charge of all phases of technical development for the company.

Mr. Mercer comes to the company from the Sherwin-Williams Co. of Canada Ltd., where he started as a chemist in the Montreal Oil Division, and soon after was put in charge of that technical department. In 1948 he was appointed chief chemist, a position which he held until his recent change. A specialist in emulsion paints, Mr. Mercer is a member of the Chemical Institute of Canada, a Professional Member of the Quebec Association of Professional Chemists and is the new President of the Montreal Paint and Varnish Production Club.

N. D. "Norm" Warriner, chief chemist, is retiring after many years of service. Mr. Warriner has been one of the big factors in the development of many products and the introduction of new ideas which are now bywords in the paint industry.

An engineering graduate of McGill University, Montreal, he joined the then infant McColl-Frontenac Oil Co. as a chemist. He joined B-H in 1934 as an analytical chemist and since then became its chief chemist and head technical man.

Mr. Warriner is a member of the Chemical Institute of Canada, the Montreal Paint and Varnish Production Club and the Society of Chemical Engineers.

NUODEX PRODUCTS

James P. Scullin has been appointed chief of the vinyl applications laboratory of Nuodex Products Co., a division of Heyden Chemical Corp., it was announced by Arthur Minich, vice president of Heyden in charge of Nuodex operations.

Mr. Scullin joined the company in 1955 as senior chemist in the vinyl applications laboratory, established to provide customers with specialized technical service relating to Nuodex's line of stabilizers and plasticizers. From 1951 to 1955 he was associated with Heyden Chemical Corp. Prior to that he was with Rohm and Haas.

CARBON DISPERSIONS

Wilbur V. Keegan has joined the company by purchase of stock and, as vice president, will engage in technical and sales development, it was announced by Dr. Arthur Brauch, president.

W. V. Keegan

Mr. Keegan has over 15 years of experience in the paint, printing ink, and plastic fields, as well as in the manufacture of concrete admixtures. His past associations include: ink technician at the Sigmund Ullman Division of General Printing Ink Corp.; patent counsel of Sun Chemical Co.; assistant to the president of A. C. Horn Co. and Cook & Dunn Paint Corp., and vice president and director of The Valspar Corp.

HEYDEN CHEMICAL

Richard H. Boggs has been appointed export sales manager of Heyden Chemical Corp. and its Western Hemisphere subsidiary, Heyden Export Corp., according to an announcement by T. M. O'Neil, vice president of marketing.

Mr. Boggs has been assistant to the director of overseas operations of Nuodex Products Co., a division of Heyden, since he joined the organization in 1955.

Previously he was associated with the American Petroleum Institute, H. K. Porter Co., Inc. and the United Nations.

EVANS RESEARCH

Dr. Donald A. M. Mackay has been appointed associate director of research, it was announced by Dr. E. G. McDonough, vice president.

Dr. Mackay left August 1 on a trip to England and Scotland, where he will visit organizations affiliated with the Evans Research and Development Corp. He will also visit various laboratories, manufacturers, and academic institutions in order to bring back to the United States the latest in methods and techniques in chemical research.

Dr. Mackay, a specialist in applying spectrophotometric and chromatographic techniques to problem solving in chemical research, is one of the inventors of the recently announced process for restoring fresh natural flavor to a wide variety of processed foods by use of enzymes.

Four additions to the technical staff have been announced by Dr. Eric J. Hewitt, vice president.

The new members are **Raymond Albrecht,** from St. John's University; **Herbert Kaplan,** from Cornell University; **Paul Mech,** from Pepsi-Cola Co.; and **Pauline Sanders,** from Helene Curtis.

SINCLAIR CHEMICALS

Robert C. Sweeney has been appointed Manager of Market Development in charge of the company's market research and product development activities with headquarters in New York.

R. C. Sweeney

Mr. Sweeney was employed by the American Sugar Refining Co. in 1949 as technical representative. In 1951 he joined the Hercules Powder Co., and in October of 1952 joined the Market Development Department of Sinclair Chemicals, Inc. He is a member of the American Chemical Society, The Chemical Market Research Association and the Chemical Industry Association.

ARMOUR & CO.

Jack Maloney has been appointed petroleum technical service adviser for the Chemical Division, with headquarters in Chicago.

Mr. Maloney joined the company six years ago, becoming a member of the New York staff as chemical salesman for New Jersey. After serving 19 months as lieutenant on recall duty with the Marine Corps, he rejoined the Chemical Division in February, 1952, and was transferred to the Philadelphia office servicing southern New Jersey and Pennsylvania area, east of Pittsburgh.

C. D. LaSusa, who formerly held the position of petroleum specialist, has assumed the duties of southern regional manager. His area includes all of the states south of Virginia, and west to, and including, Texas.

DEWY and ALMY CHEMICAL

Russell L. Haden has been appointed general manager of the Organic Chemicals Division, it was announced by W. L. Taggart, executive vice president. He will be responsible for the division's manufacturing plants in Cambridge and Acton, Mass. as well as for all sales and research activities.

R. L. Haden

Mr. Haden has been with the company since 1944, coming from the War Production Board, Office of Rubber Director where he worked on the development of synthetic rubber plants. Previously he had been employed as a chemical engineer with Proctor and Gamble, and as chief chemist for the Continental-Mexican Rubber Co. in Torreon, Mexico.

AMERICAN CAN

L. G. Weiner, former department supervisor of sales in the Central Division, has been appointed assistant to the manager of sales, it was announced by F. B. Newcomb, Canco's Central Division sales manager.

Mr. Newcomb also announced these other appointments:

R. C. Coleman, former assistant sales manager of the Chicago district, as manager of the firm's Gulf district, with headquarters in New Orleans.

J. M. Dalton, a former salesman in the Chicago district, as assistant Chicago district sales manager, succeeding Mr. Coleman.

Paul M. La France, former assistant Central division commodity manager in charge of beverage and miscellaneous foods, as commodity manager of the same division, succeeding **T. L. Shackford,** retired.

NATIONAL LEAD

Daniel B. Robertson has joined the sales force of National Lead Company's Titanium Pigment Corp., with headquarters in Los Angeles. Mr. Robertson was a 1952 graduate of Virginia Military Institute, with a B. S. degree in chemistry. Prior to his employment with Titanium, he spent three years in the U. S. Army.

O'BRIEN CORP.

Arthur V. Hankinson has been appointed a chemist in the industrial laboratory division, it was announced by John T. Lauder, technical director of the company. He will be responsible for the formulation of product finishes, government specified finishes, as well as provide technical service to customers,

Dressing table by Brunovan, Inc.

look...
it's
TITANOX*

She'll be sitting pretty! And the attractive whiteness that brings out the gracious lines of her period furniture is no accident. It's the TITANOX white pigment that makes the finish hide so well and look so good.

TITANOX is the No. 1 choice in white pigments not only for furniture finishes but also for all paints, plastics, ceramics, paper, rubber and anything that needs white pigment. Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1; Vancouver 2.

*TITANOX *is a registered trademark for the full line of titanium pigments sold by Titanium Pigment Corporation.* 4202

NEW!

From P.V.O.'s Research and Development Division

METHYL LINOLEATES

Methyl Linoleate-ML, Bleached Methyl Linoleate-MLB, Conjugated Methyl Linoleate-ML22—All Produced From Safflower Oil

Here are some of the important advantages these new vehicles offer polymer and alkyd manufacturers.

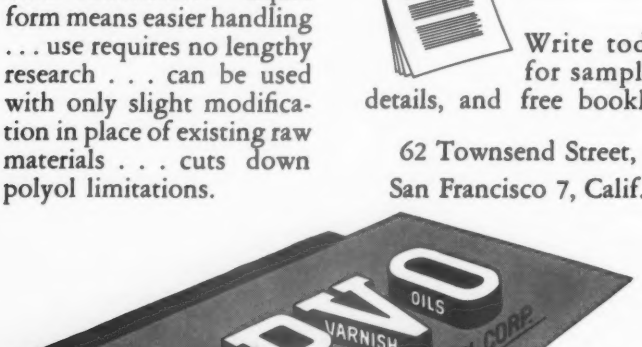
EXCELLENT PERFORMANCE—high percentage of non-yellowing linoleic esters, practically no linolenic, low saturated fatty acid content . . . fast drying, good color retention, better flexibility.

HIGH VERSATILITY—liquid form means easier handling . . . use requires no lengthy research . . . can be used with only slight modification in place of existing raw materials . . . cuts down polyol limitations.

LOW COST—low in cost compared with fatty acids . . . will sell in same range as Safflower oil . . . prices are based on the stable Safflower oil price.

Write today for samples, details, and free booklet!

62 Townsend Street,
San Francisco 7, Calif.



NATIONAL STARCH

Robert A. Bintz has been appointed plant manager of the Indianapolis plant, it was announced by Herbert C. Piel, vice president in charge of the Indianapolis operation, and a director of the company. Recently elected assistant vice president, Mr. Bintz started his career with National at the Indianapolis plant in 1939, eventually becoming superintendent of that plant. In 1946 he was made manager of the Plainfield plant and in 1954 became assistant director of manufacturing.

R. A. Bintz

J. D. George

G. K. Smith

Also announced was the appointment of **J. Donald George** as assistant director of manufacturing with headquarters at Plainfield, N. J. He joined the company in 1939, and has been superintendent of production at Indianapolis.

Glenn K. Smith was made general superintendent of the Indianapolis plant, in charge of both production and engineering. He has been with National since 1941, and until this new appointment was superintendent of engineering at Indianapolis.

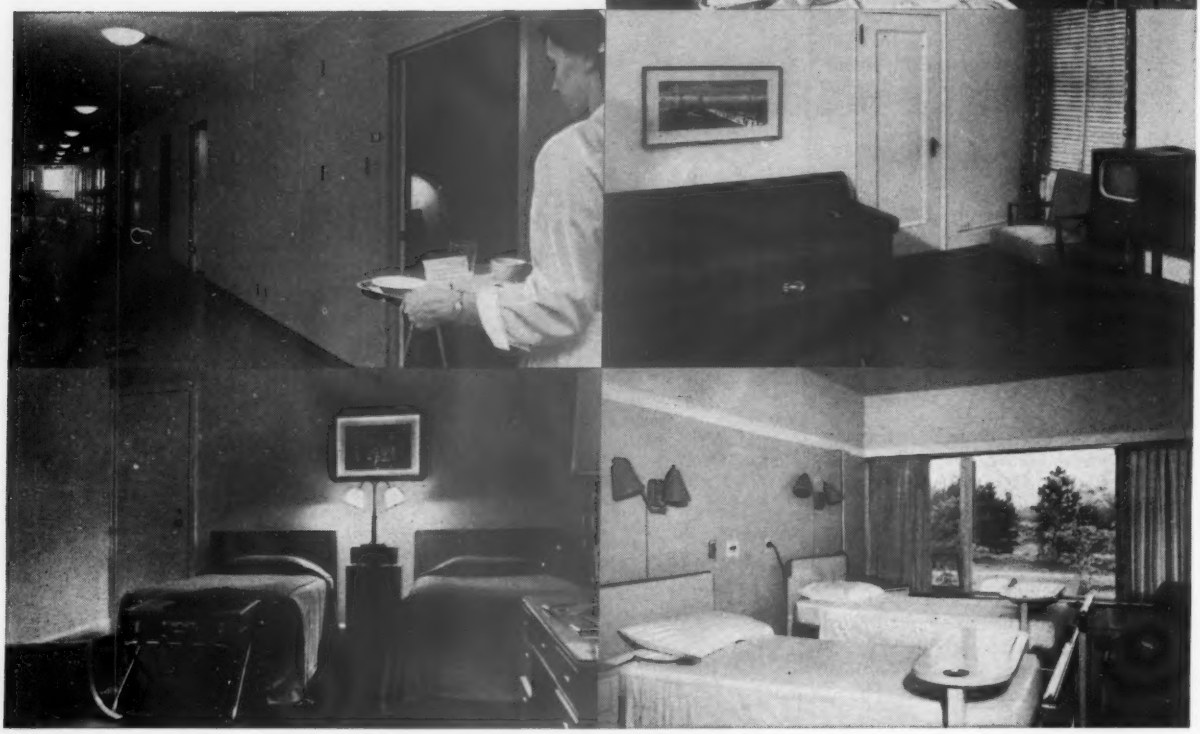
U. S. DEPT. OF COMMERCE

Dr. U. T. Greene, an executive of Diamond Alkali Co., has been appointed director of the Chemical and Rubber Div., Business and Defense Services Administration, U.S. Department of Commerce, it was announced by Charles F. Honeywell, BDSA administrator.

In accepting this appointment, Dr. Greene brings to his new post a broad business background based on more than 20 years' experience in the fields of applied industrial chemistry and metallurgy. With his current, specialized knowledge of chemical engineering and processing and their economic importance, he will serve the agency actively as director of BDSA's Chemical and Rubber Division for the next six months. This training will qualify him to become a reservist who might be called upon to serve the government in any future emergency.

DOW

Another big market turns to LATEX PAINTS



Institutions join homeowners and decorators in swing to LATEX

Now, more and more hotels specify latex paints. 37% of all hospitals use latex paints. Every day more restaurants insist on these *modern* paints. The same is true of other institutions. Why? Because latex paints offer advantages no other paints can match!

Consider the fast-drying benefit. Rooms are painted *twice* and used the same day—with no painty odor. Equipment is rinsed clean in tap water to save bother and expense of cleansing solvents. With the easy application of these truly modern paints, minimum crews do maximum painting —and the colorful, cheerful atmosphere promotes good business, complements good food. Yes, institutions' demand for latex paints is *big*. And it's getting BIGGER every month!

Dow Promotions Boost Sales

A three-pronged attack is increasing sales to institutions. This year alone, eighteen full-page ads are scheduled in *Hotel Management*, *Modern Hospital* and *Institutions Magazine*. This is supported by promotions and direct mail to assure ever greater sales to every kind of institution.

For information see your Dow representative. Or write: THE DOW CHEMICAL COMPANY, Midland, Michigan—Plastics Sales Department PL 566L.

you can depend on DOW PLASTICS

LATEX T.M. DOW

CIBA ARALDITE®

"First in Epoxies"... now brings first Quality-Controlled Resins to paint formulators!

Pioneered by CIBA, Araldite Epoxies come labelled and signed to assure you that each shipment has met your APPLICATIONAL requirements as well as our own rigid PRODUCTION quality control.

CIBA PROVIDES . . .

1. Production quality control
2. Applicational quality control

CIBA ARALDITE EPOXIES are your key to the big 3 in successful paint formulation today. Basic resin quality . . . ready adaptability . . . time-saving production economy . . . add up to what ARALDITE Epoxies deliver to make coatings that provide exceptional adhesion, flexibility, and chemical resistance, among other properties unique to this one resin class.

CIBA's TECHNICAL SERVICE, recognized as the finest in its field, includes the most up-to-date Technical Bulletins and Data Sheets on Epoxies. For detailed information on ARALDITE Epoxies, write for—

NEW BULLETIN No. 18 ON SURFACE COATING RESINS

SURFACE COATING APPLICATIONS OF ARALDITE EPOXY RESINS

number	*uses*
6071	Air dry finishes. Baked finishes. Extra thick coats at high solids. Corrosion-resistant finishes.
6084	General purpose esters. Lower cost. One package systems. Easy brushing.
6097 6099	Baked finishes for optimum resistance to chemicals, solvents and abrasion.

CIBA COMPANY INC. PVP-9

Plastics Division, Kimberton, Pennsylvania

Please send new bulletin No. 18 on Surface Coating Resins.

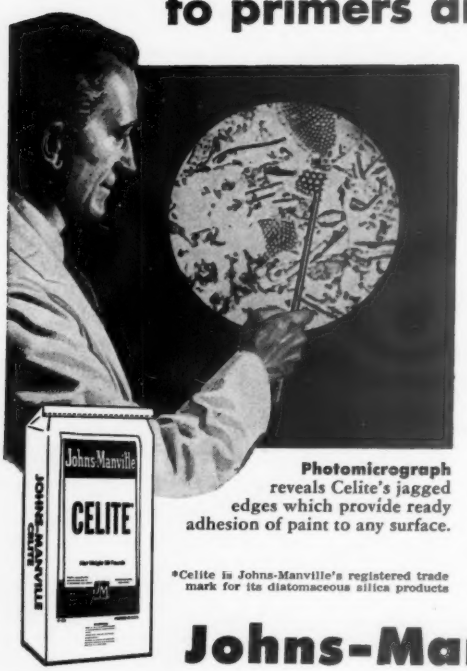
NAME_____

COMPANY_____ TITLE_____

ADDRESS_____

CITY_____ STATE_____

CELITE diatomite pigments add "tooth" and toughness to primers and topcoats



Photomicrograph reveals Celite's jagged edges which provide ready adhesion of paint to any surface.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products

NO ONE examines the performance of paint ingredients more critically than government experts. And time after time, they specify Celite*. These microscopic particles of silica are hard and tough. Suspended in the paint film they provide extra durability for the severe conditions which military and maintenance coatings must withstand. Their irregular shapes projecting through the film anchor primers to any surface . . . give an excellent "tooth" for adhesion of topcoats.

Celite provides control of gloss to any degree including the dead flat finish required for military camouflage coatings. When used as a filler, Celite's high bulking properties hide surface imperfections and ease sanding. The loosely interwoven structure of the tiny particles creates a flexible film highly resistant to cracking.

Special grades of Celite have been developed for many different military and maintenance applications. Write for complete information to Johns-Manville, Box 60, New York 16, N. Y. In Canada, address 565 Lakeshore Road East, Port Credit, Ontario.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville CELITE THE EXTENDER PIGMENTS FOR ALL COATINGS

SINCLAIR CHEMICALS

Ray C. Smith has been appointed manager of domestic sales. Previously manager of market development for the company in New York, Mr. Smith will now manage the company's chemical marketing activities. He will headquarter in New York.

R. C. Smith

In 1947 Mr. Smith entered the Sinclair Research Laboratories at Harvey, Ill., as technologist in the Lubricants Division and rose to the position of section leader, lube processing section. In September, 1952 he was appointed manager of market development. He is a member of the American Chemical Society, Chemical Market Research Association and the Chemical Industry Association.

AMSCO

Thomas Barker has been appointed manager of special products sales for American Mineral Spirits Co., it was announced by E. M. Toby, Jr., president. This department has the responsibility for the sale of all waxes, petropons, ink oils, and other specialties distributed by the company.

Thomas Barker

Mr. Barker is assuming part of the responsibilities formerly under the direction of **Col. Martin B. Chittick,** who is planning to retire in early 1957. Before his promotion, Mr. Barker had been in charge of the company's Midsouth Division. A graduate of the University of Miami with a B.S. Degree in Chemistry, Mr. Barker will be located at the company's Chicago office.

AMERICAN CHEMICAL PAINT

Leon Cherksey has become chairman of the board and is succeeded as president by **Gerald C. Romig.**

As chairman, Mr. Cherksey is the first officer in the company's history to serve in this new capacity. He has been with ACP 37 years having joined the firm in 1919. He became secretary-treasurer in 1930, and in 1939 became president, a position held until the recent management change.

Mr. Romig, the new president, came with ACP in 1927 and his experience of almost thirty years includes 18 years in the Research and Development Department and 11 years as vice president. Both are on the board of directors.

SHAWINIGAN RESINS

Robert E. Grandpre has been appointed to the technical service department, it was announced by W. K. Wilson, technical service manager.

Formerly with the company's research department, Mr. Grandpre now will be responsible for providing technical assistance to Shawinigan customers. Among the products he will handle are, "Gelva," polyvinyl acetate, and "Gelvatol," polyvinyl alcohol.

ADVANCE SOLVENTS

J. L. "Jerry" Frankel has been appointed sales service representative for the New York metropolitan area by Advance Solvents & Chemical, Division of Carlisle Chemical Works, Inc., it was announced by George W. Gregg, sales manager. He will work closely with the Jesse S. Young Co., Advance's New York agents.

COMMERCIAL SOLVENTS

Richard T. Ozimek has been named supervisor of petrochemicals market research, according to an announcement by Dr. Frank E. Dolian, manager of the Market Development Dept.

Mr. Ozimek served for some years as a research chemist at Picatinny Arsenal. Most recently he held the position of market analyst with the National Aniline Division of Allied Chemical and Dye Co.

In his new capacity, Mr. Ozimek will be responsible for coordination of all market research for the company's petrochemical products: anti-freeze, automotive chemicals, ammonium nitrate fertilizer, nitroparaffins, and other industrial chemicals. He will make his headquarters at the company's general offices in New York City.

For Exterior Finishes...

Formulate Your *Mildew Resistant Paints* with HORSE HEAD ZINC OXIDES

Paints that contain enough zinc oxide resist mildew.

Your best source of zinc oxide is the wide range of types and grades in the Horse Head family (see table).

That variety enables you to formulate your mildew resistant paints without sacrifice of other important properties.

HORSE HEAD ZINC OXIDES

for Outside House Paint

LEAD-FREE

GRADES	PARTICLE SHAPES	PARTICLE SIZES	OIL DEMANDS
XX-2	SPICULES MULTI-FACETS JACKS	MEDIUM	16
XX-50	SPICULES MULTI-FACETS JACKS	MEDIUM LARGE	15
XX-55	SPICULES MULTI-FACETS JACKS	MEDIUM	17
XX-503	ROUNDS	LARGE	11
XX-505	SPICULES MULTI-FACETS	MEDIUM LARGE	18
XX-601	ACICULARS	MEDIUM LARGE	14

LEADED

GRADES	WHITE LEAD CONTENT %	PARTICLES	OIL DEMANDS
Lehigh-6	35	CO-FUMED	12
Lehigh-61	35	BLENDED	14
Lehigh-635	35	ACICULAR	13
Lehigh-250	50	BLENDED	12

THE NEW JERSEY ZINC COMPANY
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160 FRONT STREET, NEW YORK 38, N. Y.

HORSE HEAD PRODUCTS

BOSTON 11, MASS. 137 Kneeland Street
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CLEVELAND 14, OHIO National City Bank Bldg.
OAKLAND 4, CAL. 95 Market Street
LOS ANGELES 21, CAL. 2424 Enterprise Street

SCHENECTADY VARNISH

Donald L. McClenahan has been appointed chief engineer of the newly formed electrical testing and development laboratory, it has been announced by J. W. McHugh, vice president.

D. C. McClenahan

In his new capacity, Mr. McClenahan will be responsible primarily for the preliminary evaluation of new, high-temperature resins and varnishes developed in the firm's existing research and development laboratories for use by the electrical industry. He will be located at company headquarters in Schenectady, N. Y.

Prior to his present appointment, Mr. McClenahan served for a number of years as a technical representative for the firm in the Midwest.

REARDON

Eugene J. Weston has been appointed sales representative for New York City and Long Island, according to an announcement from Harold F. Volgstadt, Eastern Division sales manager. He received his appointment after successfully completing a training course conducted by Mr. Volgstadt at the new Reardon plant in Kearny, N.J. Before joining the company, Mr. Weston had five years' experience in sales, sales promotion and sales management.

John W. McLin has been appointed sales representative for the company in Georgia and Florida, it was announced by James E. Cody, St. Louis Division sales manager. His appointment followed an intensive course of training in Reardon products conducted by Mr. Cody. Mr. McLin brings 15 years of sales experience to his new appointment, including eight years' sales management and sales promotion in the South.

Mr. Cody also announced the appointment of **Charles H. Hopper** and **Frank J. Theobald** as sales representatives.

Mr. Hopper, whose sales area includes Dallas, Fort Worth, and the Shreveport area of Louisiana, spent ten years in sales and sales promotion work before joining the company.

Mr. Theobald will represent Louisiana, the Camden area of Arkansas, and Southern Mississippi, including Vicksburg, Jackson and Yazoo City. His appointment followed a period of intensive training at the company's general offices in St. Louis. He has had twenty years' experience in the sales field in the South and Southeastern United States.

Leon J. McDonald, Jr., has been appointed sales representative in Oklahoma, the Panhandle area of Texas, and southern Kansas, including Wichita, Hutchinson, Dodge City and Garden City. He has had eight years' of experience in sales and sales promotion work.

AMERICAN CYANAMID

Lawrence E. Ross, chemist in the Development Group at the Piney River, Va., plant was recently honored at a ceremony marking his 25th year with the firm. **Dr. W. J. Cauwenberg,** technical director of the Pigments Division, presented the 25-year award.

The oldest employee in length of plant service, Mr. Ross received his B.S. in chemical engineering from the Carnegie Institute of Technology in 1926.

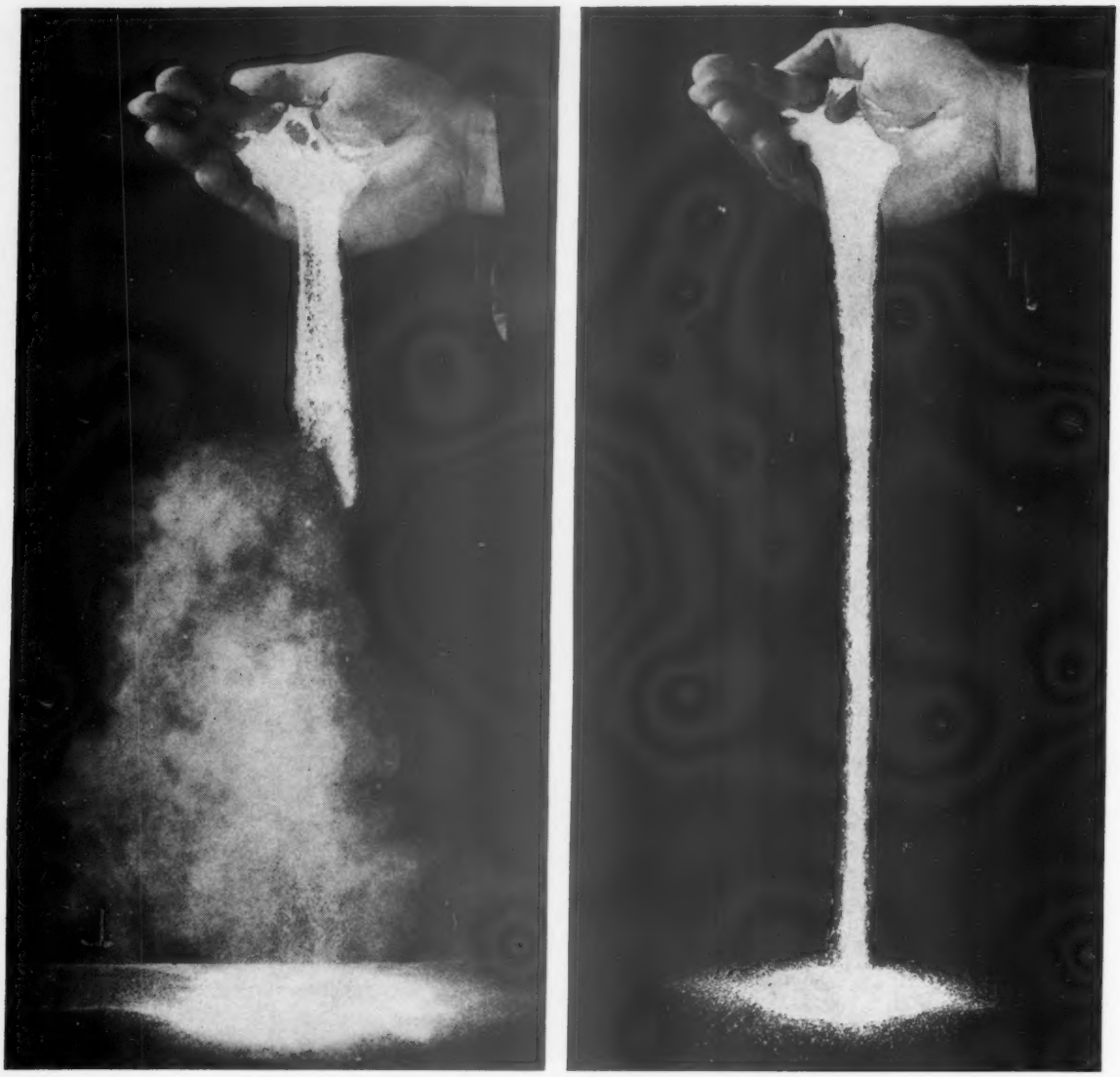
EMERY INDUSTRIES

Robert H. Dhonau and **Arthur R. McDermott** have been added to the staff of the Development and Service Department.

According to W. T. Meinert, director of the department, they will be concerned with the development of all new products as well as technical service for both the fatty acid and Organic Chemicals Sales Departments.

Prior to joining the Development and Service Department, Mr. McDermott handled the sale of Emery's industrial chemicals first in the Chicago area and then in the Southwestern States.

Mr. Dhonau has been a member of the applications research group of Emery's Research Laboratories for the past ten years.



THE OLD AND THE NEW—These unretouched photographs tell the story. At the left is regular "low-dusting" PE, at right, Hercules' new nondusting grade.

HERCULES HAS REMOVED THE "DUST" FROM PE

Hercules' new nondusting technical PE is now available in full commercial quantities—at no increase in cost!

This new grade of Hercules® technical pentaerythritol has a more uniform particle size. There is no change in its carefully balanced chemical specifications, but through entirely new mechanical processing methods all fines and "smoke" are eliminated.

The result is greater safety, better working conditions (especially during charging), and more uniform reactions because fewer fine particles collect on the dome of the kettle and in the condensers.

Specify the new Hercules nondusting grade on your next PE order and see the difference for yourself. For further information, contact your nearest Hercules district sales office, or write:

Synthetics Department
HERCULES POWDER COMPANY
INCORPORATED
926 Market Street, Wilmington 99, Del.

SPSS-1

L. M. Welch

C. N. Wolf

PETRO-TEX CHEMICAL

Dr. L. Marshall Welch has been appointed director of research, with headquarters in the company's Houston, Texas laboratories. Dr. Welch has been in charge of petrochemical research for the central research laboratory of the Chemical Divisions, Food Machinery and Chemical Corp. and will continue to have responsibility for these activities.

Prior to joining the company, Dr. Welch was president, Carter-Bell Chemical Co., and was previously associated for eight years with Standard Oil Development Co. and E. I. du Pont.

Dr. Calvin N. Wolf has been named to succeed Dr. Welch on petrochemical research at the central research laboratory now being completed at Princeton, N. J. He was formerly associated with Ethyl Corp.

DOW CHEMICAL

Elmer K. Stilbert has been promoted to staff manager of coating materials for the Plastics Department, it was announced by C. B. Branch, departmental manager. Mr. Stilbert served previously as assistant manager of coatings technical service.

In his new position he will be responsible for long-range planning for coating materials and for assuring a balanced effort on these products to promote growth and continued profitable operations.

Mr. Stilbert started with the company in 1940 as a research chemist and was associated initially with the cellulose products laboratory. Becoming assistant manager of coatings technical service in 1949, he continued in this capacity until taking over his new post, except for a year's assignment as manager of priorities and allocations from 1952 to 1953. He is credited with several patents in the coatings field and is the author of a number of papers on coating materials.

R. J. BROWN

R. J. Brown, president of The R. J. Brown Co., which recently became affiliated with Ashland Oil and Refining Co., has announced the following appointments to the board of directors:

Grover C. Shropshire, a graduate of the U. S. Naval Academy, and formerly connected with the Sales Department, Ashland Oil & Refining Co.

E. L. Metcalf, vice president, **Charles C. Berry,** vice president and **A. H. Wallace,** vice president.

Messrs. Shropshire and Metcalf will maintain their offices in the St. Louis headquarters of the company, and Berry and Wallace will continue to direct activities in the Detroit and Cleveland areas respectively.

AMERICAN CAN

W. S. Beard has been appointed manager of sales for the Atlantic Division, it has been announced by T. E. Alwyn, vice president in charge of East Coast operations.

Mr. Beard, former assistant division manager of sales, succeeds **Daniel T. McFadden,** who has been appointed assistant to Edward K. Walsh, Canco's general sales manager.

Mr. Alwyn also announced these other Atlantic Division sales appointments:

D. B. Ressler, former North Jersey district sales manager, has been appointed assistant manager of sales. He will be succeeded by **R. V. Bradley,** former salesman in the metropolitan New York district sales office.

J. M. Asensio has been appointed assistant to Mr. Beard, succeeding **E. J. Gazda,** who has been appointed supervisor, administrative group of the division sales force.

D. J. DeLand, former manager of the Philadelphia district sales office, has been appointed commodity manager in charge of fibre container sales. He will be succeeded at Philadelphia by **W. H. Gaul,** former salesman in the Philadelphia district office.

BLISTER BOX

(*From page 38*)

compound around the edges of the rectangular cutouts. This will form a gasket, to seal the juncture of the cedar panels and the can surface.

5) With brass screws, attach panels to vertical wood strips. Insert rubber stopper with thermometer and vapor escape valve (made from rubber tubing with 1" slit side) in place. (See C).

To run a test. . . in the lab or for in-store demonstrations:

A. Paint two opposite panels with two coats of polyvinyl acetate white paint.
B. Paint two opposite panels with two coats of oil-base white paint. (Allow normal drying time between coats and after final coat before beginning test. Be sure to paint all of the edges of the panel, so that the paint film touches the metal surface of the can.)
C. Remove the rubber stopper and pour in one quart of water. Replace stopper.
D. Check vapor escape valve to make sure it is operable. (Valve prevents the rapid escape of the water vaopr, and avoids pressure build-up inside the can.)
E. Place blister box on a 3-heat, 500-watt hotplate set at low heat. (Important—check water level daily.)
F. Allow temperature inside the can to reach approximately 50° Centigrade.

This test is said to cause blistering of ordinary oil paint films in from 3 to 7 days. Paints having a high degree of moisture permeability, will not blister.

•

W. R. Grace, Glidden Form Colombian Paint Company

W. R. Grace & Co. and The Glidden Co. have jointly announced a million-dollar investment in Colombia to manufacture and distribute a broad line of quality paints to local Colombian markets.

According to the announcement, W. R. Grace & Co. has a two-thirds interest and The Glidden Co. a one-third interest in Pinturas Ico Ltda., the newly-formed company. The investment includes the purchase of Flesch y Cia, Ltda. a well established paint business and modern paint plant in Barranquilla, Colombia. Plans call for the installation of additional machinery and new buildings to permit the rapid expansion of total output.

Under the agreement, the new company will combine Glidden's technical know-how and paint formulas with Grace's distributing experience in Latin America. Two Grace subsidiaries are leading producers of paint in Peru and Chile. They have been licensed to sell Glidden paints and to use its formulas for more than a year.

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C.M. Thorsen Honored

Charles M. Thorsen, sales consultant to the Union Bag-Camp Paper Corp., was given formal recognition recently by the members of the Tall Oil Division of the Pulp Chemicals Association when he was presented an inscribed silver testimonial tray. In making the presentation, Albert Scharwachter, division chairman and president of the association, described Mr. Thorsen as "Dean Emeritus of the tall oil industry."

NEWS

Hercules' Tall Oil Plants Designed for 80% Yield

Hercules Powder Company's two new tall oil fractionation plants are expected to yield 115,000,000 pounds of rosin and fatty acids out of the 140,000,000 pounds of raw material processed a year, according to a company announcement.

One of the plants, at Franklin, Va., is now on a shake-down production basis. The other, at Savannah, Ga., identical to the Franklin plant, is expected to start production at the end of the third quarter.

Dr. John H. Long, general manager of Hercules' Paper Makers Chemical Dept., said the two plants are designed for an 80 per cent product yield of rosin and fatty acids. "However, these are flexible distillation columns capable of separating crude tall oil, either into the two principal products, or any desired combination," Dr. Long said.

Hercules' modern tall oil distillation plants at Franklin and Savannah are "tailored to meet the needs of existing markets," the company said. Crude tall oil, to be processed at both plants, is obtained from neighboring kraft pulp mills under long-term agreements, assuring a continuing supply of the plants' essential raw material feed.

Based on almost forty years' experience in processing industrial chemicals from wood naval stores, Hercules research anticipates the production of useful chemical derivatives from the by-products resulting from tall oil fractionation.

Tall oil fatty acids, by-products, have a major market in protective coatings which, in the alkyd resin field, will also consume Hercules-produced pentaerythritol.

•

Find Method to Speed Wrinkling on Finishes

A method for speeding up the wrinkling of the widely-used wrinkle finishes has been developed by the Commonwealth Engineering Co. of Ohio. The process is outlined in two patents (Nos. 2, 744, 832 and 2,744,833) issued by the U.S. Patent Office.

Key factor in the speeding up of the wrinkling or drying action is a powerful siccative derived from a seed grown in India, the Philippines and a few other countries. It is technically known as Mallotus philippinensis, and for many years has been known in India for the purpose of poisoning fish. Its drying qualities are said to be much more rapid than the conventional tung oil, and it can be blended in varying degrees with the ingredients used for many finishes.

For regular paints, it will generally speed the drying action. In the case of wrinkle finishes, it will speed up the wrinkling and drying action.

Commonwealth Engineering, an industrial research firm, will not manufacture any of these products, but will license such manufacture by outside organizations.

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To Expand Titanium Plant

The highly successful results obtained to date from the new Adrian Joyce titanium dioxide plant in Baltimore has prompted the Glidden Co. to authorize immediate construction of additions to the plant which will quadruple its capacity by 1957, Dwight P. Joyce, chairman and president, stated.

FUNGUS STUDY

(*From page 41*)

area, the template opening can be reduced to one-half or one-fourth of the suggested size. The area of the template opening, and the number of readings taken per panel can be modified to suit the specific needs of the observer. The important thing is that, regardless of the number of readings, they should be taken in such a manner that they are representative of the entire panel.

This method of estimating fungus growth is valid only when the growth is distributed over a fair amount of the surface area. It should not be used when the fungus growth is concentrated over a localized area (Fig. 3) while the rest of the panel may show slight or even no growth whatsoever.

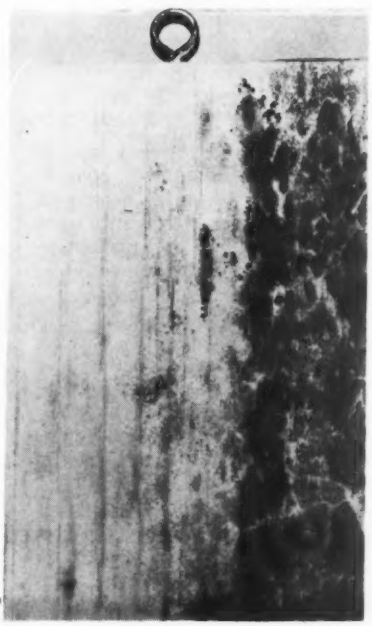


Figure 3. When the fungus growth is localized as shown on this paint panel the results obtained by the use of the template method may be misleading.

This principle of reading small sections to evaluate a large area should be useful in other fields where comparative evaluations of surfaces changes are necessary. Estimation of corrosion, peeling of paint, blooming or blistering, are just a few of the possible applications.

Reorganize Paint Lab

The paint research laboratory of Canadian Industries Ltd., Toronto, Canada, has been reorganized with the aim of emphasizing the importance of developing radically new products while dividing the responsibility for maintaining leadership in current markets.

According to A. R. Stewart, research and technical manager of the Paint Div., the work of the laboratory, under laboratory manager M. R. Feely, has been divided into three main sections: exploratory research under supervisor P. R. Day; applied research in the industrial and automotive fields under supervisor A. L. Johnson, and applied research in trade sales and consumer products under supervisor D. T. Rattray.

•

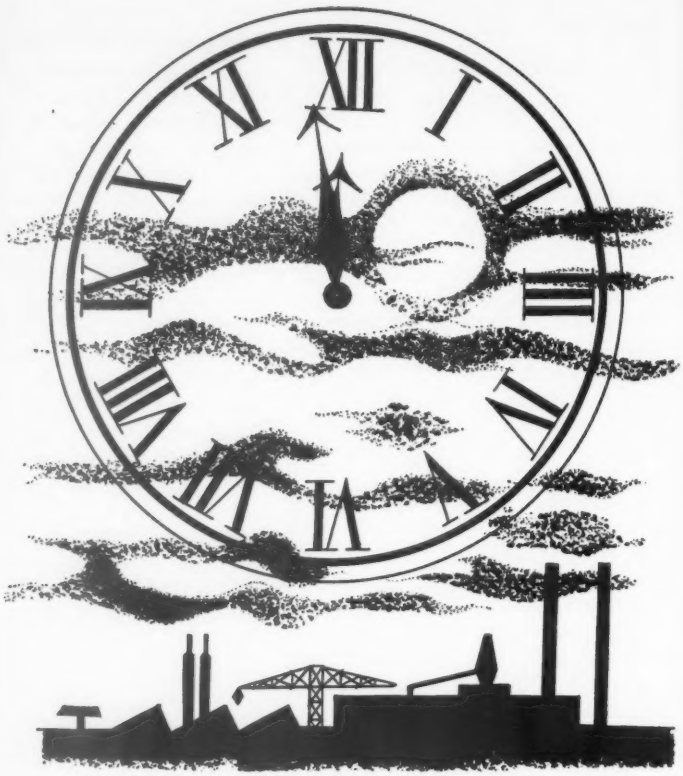
New Morehouse Group

To further improve service to its rapidly growing foreign markets Morehouse Industries Inc. has announced the incorporation of its Export Division under the name of Morehouse International.

The new corporation will distribute Morehouse Mills, Cowles Dissolvers and certain other complementary equipment for the processing industries to foreign countries, with the exception of Canada.

DEADLINE—MIDNIGHT

How Quick Service Paid Off For One Of The Nation's Leading Vitamin Producers



Fast action was called for. Through an oversight, one of America's leading pharmaceutical manufacturers was in trouble. His supply of extraction solvents—vital in vitamin processing was almost gone. 2000 gallons of solvents were needed by Saturday midnight. Otherwise, the production line would shut down, spoilage would result, men would be laid off, production schedules would be disrupted.

The time was Saturday afternoon.

The P.A. called the salesman. He'd gone fishing. But his home contacted the sales manager. The sales manager called the plant manager. "Meet me at the plant," he said. Together, they called a transport driver. Personally, they filled the transport and the order was delivered before dinner.

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abstracts

Heats of Solution of Polyindene

J. Vanderryn, Kentile Corp., Brooklyn, N. Y., and A. C. Zettlemoyer, Lehigh University, Bethlehem, Pa.

The heats of solution were determined for a polyindene type resin (molecular weight 749) and four of its fractions in twenty organic solvents. The intrinsic viscosity of the unfractionated polymer was also determined in five of these solvents. Both endothermic and exothermic heats of solution were obtained. The heat of solution is related to the chemical nature of the solvent-polymer interaction and to the structure similarities between polymer and solvent. The heat of solution also depends on the thermodynamic state of the polymer which, in turn, is related to its molecular weight, and which is reflected in its second-order transition temperature. A type of "acid-base" interaction—e.g., between the acid hydrogen of chloroform (and *s*-tetrachloroethane) and the double bond in polyindene—is proposed to account for the exothermic heat of solution in these solvents.

The intrinsic viscosity is low for endothermic solvents and high for exothermic solvents. The magnitude of the heat of solution is of little importance in influencing the amount of extension or contraction of the polymer molecule in solution as indicated by the intrinsic viscosity.

Kinetics and Mechanism Of Alkyd Photo-Oxidation

C. D. Miller, Marshall Laboratory, E. I. du Pont de Nemours & Co.

The kinetics of alkyd photodegradation have been followed by measuring changes in the visible interference spectra of thin films, as a function of film thickness and intensity and wave length of ultraviolet irradiation. The rate of loss of film thickness is nearly proportional to light intensity at all wave lengths and film thicknesses investigated. At short wave lengths (< 2500 A.) the reaction is linear with time and independent of thickness. Above 2500 A., the degradation occurs more slowly and is a bulk reaction. Consideration of the rate data indicates that the reactivity of the remaining film decreases with exposure. This is confirmed by infrared data which suggest that the primary attack (above 2500 A.) is in the aliphatic portion of the molecule, and the degradation of the phthalate which occurs at these wave lengths in photosensitized by the unsaturation of the drying oil or by secondary structures derived therefrom.

Lacquers For Army Ordnance Materiel

Charles F. Pickett, Aberdeen Proving Ground.

There is a need for high speed finishing systems for ordnance materiel. With new and better modifiers available, it is possible to formulate lacquers of excellent durability. As a result of new analytical procedures, it is possible to exercise proper control on quality. With greater attention to the proper cleaning and preparation of metal substrata, greater assurance on the satisfactory performance of lacquer is obtained. The advent of good equipment for hot spray application eliminates the objections to high solvent cost and application of multiple coats. Excellent formulations and specifications have been prepared. Both single- and multiple-coat systems have been recommended and used. The prediction of excellent durability has been substantiated in actual production items. Manufacturers of ordnance materiel have been provided with the benefit of fast air-drying durable finishing systems.

Kinetics Involved In the Oxidation of a Diolefine

By J. Morgner.

The research conducted had the object of obtaining a picture on the kinetics of the catalyzing auto-oxidation of the medium polymeric diolefine "Pervinan." It was established that with the incorporation of a molecule of oxygen, a double linkage disappears. There thus resulted a straight line relationship of the double linkage number to the oxygen absorption. The oxygen content in the completely filmed polydiolefine was given by the author at 23 per cent, by which after months'-long observation only an inconsiderable further increase could be established. By determination of the peroxide number it could be demonstrated that the dependency of the peroxide content to the oxygen content runs linear over a

wide range. By comparative peroxide determinations in the film, the effect scale of the metal catalyzers, established by the drying times, could in the main be confirmed.

According to the same processes, the author also analyzed the light-sensitivity of some metal catalyzers and prepared a scale. From the tests which were detailed, a significance could be given to the group classification of the metal catalyzers. The influence of inhibitors was further investigated in this work, by which it was established that phenols and amines inhibit the filming in different ways. It could also be shown here that the drying then first sets in, when the inhibitor has been transformed completely autoxidatively into a non-inhibiting compound.

The author finally discussed the influence of temperature on the procedure of the Pervinan filming. It was stated that the maximum oxygen absorption decreases with an increase in the temperature while in the same degree the low-splitting reactions (in comparison to linseed oil), increase. These splitting processes with the filming were given special attention by the author.

Of volatile splitting products and similar in the film, there could be demonstrated carbon dioxide, water, formic acid and tricarballylic acid. In further consideration, there was considered the influence of the degree of oxidation on the physical characteristics of the film. It was stated that the Pervinane oxyne film loses its elastic and plastic characteristics with rising oxygen content, by which the thermoplasticity already disappears after an oxygen content of 6 per cent. It was found further that the refraction rises linearly with the oxygen absorption. Finally, the author established that the molecular model of the Pervinan oxyne calculated from the molecular refractions confirmed those obtained from chemical analyses. As opposed to its behavior with linseed oil, oxybenzol showed no oxidation-impeding action.

The Aging of Paint and Finish Coatings by Heat

By W. Leuser

Testing the aging resistance of paint and finish materials is of considerable significance for their qualitative judgement and for their practical application. It is known that finish materials with active pigments in practice generally behave better than finish materials with inactive pigments. Through the soap formation which is given by finish materials by active pigments, the film structure is strengthened and stabilized.

The significance of heat aging for the testing and "diagnosis" of the qualitative characteristics of finish material

was first recognized by J. Peters.

Starting from these findings made by Peters, a comprehensive series of tests of the aging influence of heat on oil and synthetic resin-containing finishes with active and inactive pigments—alone and in admixture with one another—were made.

The aging effect of the heat was followed at definite temperatures and in relation to the time by means of the Koenig pendulum hardness tester.

A series of pendulum hardness/time curves was obtained, which showed themselves as characteristic for active and inactive pigments.

With active pigments, the pendulum hardness increase with the heat aging is greater than with inactive pigments which show only a small pendulum hardness increase. Through the P. hardness/time curves even small portions of active pigments can be recognized as effectively active. With inactive pigments, the P. hardness increase is determined principally by the character of the bonding medium.

The P. hardness increase with the heat aging, according to the results which have been obtained from this investigational work up to now, should depend significantly on the portion of the active, i.e., soap-forming pigments present in the finish material as well as on the portion of the bonding capable of soap formation. The P. hardness increase appears to run proportional to metal soap formation from the active pigment and the bonding medium.

The film strength is undoubtedly an important if not the decisive factor for the aging resistance of finishes. With finish films with active pigments, the film strength and film hardness respectively, according to the investigational test results, is determined by the pigment and bonding medium; with finish materials with inactive pigments, on the other hand, the film strength depends dominantly on the characteristics of the bonding medium, as inactive pigments as inert bodies take practically no part in the process of the film hardneing.

The pendulum hardness/time curves obtained through heat aging should be suitable for rapid testing of the aging resistance and accordingly, the qualitative characteristics of finish materials, as they permit a testing and judgement of the film hardening, which again is decisive for the weathering resistance.

The heat aging/hardness testing with the pendulum hardness test apparatus after Koenig appear suitable for amplifying the existing possibilities for quality testing of finish materials by a technological test process in a valuable manner.

In the discussion to this paper the question was asked as to whether the aging testing provided a definite conclusion regarding the durability of a finish material. Many secondary factors are involved and it is known for instance, that alkyd resins change with the heat aging. There are however numerous other possibilities by which a finish film can be destroyed. It is necessary accordingly to decide which actual destructive test should be employed for judging the finish. It is of importance also to know what relationship exists between the external durability and the heat aging test.

The place and incorporation of this heat aging test may be considered as follows. It very important in the case of a weathering test to recognize the individual factors which come into effect. For these reasons the above tests were undertaken in order to study the individual influences. In this case it has been tested as to how the heat effect acts.

It was pointed out that the test work had extended in part to 1,200 hours, which would not be possible on the operational scale. The hardness testing could be regarded as a mechanization of the finger nail testing. The question arises as to what exactly does the hardness signify. One picture shows that it increases with a higher pigment content, which is self-obvious. In another picture it is shown that the finish is all the harder, the purer the zinc white. It emerged from the discussion that hardness alone is not the correct test for the aging process. It was the intention to embody this test with other test methods.

Red Lead
As a Rust Protective Pigment

By J. D'Ans

The research work described was undertaken to clarify the corrosion-inhibiting action of red lead. The interesting results of this investigation covered not only the system red lead-linseed oil with iron as the base metal. The red lead acts also in other film forming agents as corrosion-inhibiting.

It was established by the author that the outstanding effects of the red lead are based not only on the basic characteristics of the divalent lead portion but that also electrochemical exchange reactions must also be considered. Tests were described which served the purpose of following the behavior of iron in acqueous pastes of the three lead oxides. With these tests it could be established that the corrosion of the iron was noticeably accelerated by the tetravalent lead oxide (PbO_2). The reason for this is to be found in the high electrical conductivity of the brownish-black lead dioxide. Tetravalent lead oxide (PbO_2) has the capacity of forming true local electrochemical cells with iron in which it always represents the nobler electrode.

At these cathodic places, affairs can progress to an electrochemical formation of metallic lead.

It was mentioned further that the red lead shows this phenomenon to a weakened degree, but on account of its lower electrical conductivity, no local cells are formed. According to the author, the metallic lead is, in the acqueous mediums which come into consideration, less noble than the iron. Through the reduction of the red lead and through an auto-oxidation of the metallic lead, lead ions appear, which form protective coatings on the iron by the separation of difficulty soluble lead compounds and similarly seal damaged places of the coating through the electrochemical reactions. This is to be ascribed, to the content in the red lead of tetravelent lead, which is confirmed by electrochemical measurements.

By means of colored micro-photographs, the author showed the formation of metallic lead and of difficultly soluble lead compounds in damaged red lead coatings. It was mentioned further that the results obtained also allow of explaining the favorable behavior of lead cyanamide pigment, which however cannot show the electrochemical effects. Some viewpoints were also given, to make clear a part of the characteristics of wash primers.

The main question posed in the discussion was what was the best cutting medium to employ for the red lead pigment. In his paper Prof. D'Ans had indicated that of all the cutting mediums, iron oxide has proved to be the best.

Reactions at Boundary Surfaces Between Cover Coat and Base Metal

By B. Waeser

The significance of the processes, still disputed to a certain extent, that occur at the boundaries between the cover coatings and the base metal, were considered with special consideration to finishing technology. Similar phenomena, which are of importance for the consideration, were mentioned also for metal on metal. The reaction capacity of metal ground surfaces in itself, can be investigated by counter tube measurements, hydrogen peroxide formation and high vacuum reactions, respectively. The production also of coatings of cement, enamels, etc., on metals offer further examples for the reaction course. The technical data obtained was utilized briefly to discuss the important fundamental considerations of phosphating reactions, of linseed oil-red reactions and of the action of primer coatings.

Tests were conducted with phosphoric acid-polyvinylbutyral primers with zinc chromate on mild steel test parts. Selective solution with hydrochloric acid, dioxane and dimethylformamide and other considerations, show how the primer coating is formed and what role is played by the loosely ssupended iron phosphate remaining. Further test findings and preliminary results indicate some differences between normal phosphating and wash primer treatment; the danger of sub-rusting with the latter was also confirmed with these tests and this can be ascribed mainly to the varying behavior of the iron phosphate.

There follows from this a new working procedure for the primer application with sharper separation of the up-to-now normal phases. Further amplifying test results are concerned in particular with steel sheets covered with iron oxide finishes, on the behavior of steel parts subjected to electric current flow and electrophoretic conditions as well as, finally, on the possibility of the substitution of phosphoric acid by boric acid and glycero-boric acid, respectively. This work was conducted with the object of obtaining new working data for practice and, on the other hand, of obtaining conclusions on the bonding reaction between cover coatings and the ground metal.

In reply to a question put during the discussion, the author stated that it has been found that wash primers adhere in a manner which is inferior to phosphate coatings and the present work was conducted in order to find an explanation of this. As to whether chromium can be detected at the boundary surfaces, and whether it could be a question of an iron-chromium phosphate coating, data is conflicting.

NEWS

H. L. Taylor

G. L. Brown

Picco Opens Fla. Office, Cleveland Sales Residency

Pennsylvania Industrial Chemical Corp. has announced the opening of a new South Atlantic district sales office. Harold L. Taylor has been appointed district manager and will make his headquarters in Jacksonville, Fla.

Also announced was the opening of a sales residency in Cleveland. Gardner L. Brown will be in charge of the new office and will cover the northern Ohio area.

Prior to joining Picco in 1953, Mr. Taylor headed Taylor Chemical Corp. He also formed and operated for six years Ellicott Laboratories, a manufacturing and consulting company specializing in flameproofing finishes. Previous to that he was associated for 13 years with Hooker Electrochemical Co.

Mr. Brown will provide technical sales services on Picco's line of solvents and resins, with particular emphasis on coatings, paper and solvents industries. He will coordinate his work with the company's Detroit district sales office.

Prior to this appointment, he served as technical liaison with the rubber reclaiming industry, a responsibility which he will retain. He joined Picco in 1953, after having been associated with Goodyear Tire and Rubber for ten years.

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Coast Coatings Symposium Sponsored by Hercules

A coatings symposium for the West Coast protective coatings industry will be conducted Sept. 11-14 by Hercules Powder Co., in Los Angeles, Cal.

The symposium is endorsed by the Los Angeles Paint and Varnish Production Club and the Los Angeles Paint, Varnish and Lacquer Association.

The symposium has been divided into two sections. The first two days will be devoted to discussions of fast-drying industrial finishes based on nitrocellulose. The final two days will include discussions about chlorinated rubber and silicone finishes.

In addition to Hercules representatives, there will be two prominent guest speakers on the program: Dr. Carl K. Fink, Carbide & Carbon Chemicals Co., will discuss "Balancing Economy and Performance when Selecting Plasticizers and Solvents." Robert C. Hedlund, protective coatings laboratory, Dow Corning Corp., will discuss "Silicone and Silicone Alkyd Resins for Protective Coatings."

Subjects to be covered during the four-day session include: Principles of Lacquer Technology, Lacquers for Plastics, Fast-Drying Finishes for Aluminum and Steel, Furniture Finishes, Fast-Drying Floor Finishes, Cellolyn Resins for Wood and Metal Finishes, Chemical Plasticizers for Nitrocellulose and Vinyl Film-Formers, Cross-Linked Cellulose Derivative Coatings, Chlorinated Rubber Coatings, Pentaerythritol-Properties and Applications, and Rosin Resins as Modifiers.

PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Petroleum Resins

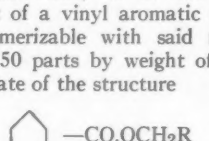
U. S. Patent 2,750,353. Stanley B. Mirviss, Roselle, and Fred W. Banes, Westfield, N. J., assignors to Esso Research and Engineering Company, a corporation of Delaware.

A process for improving the quality and yield of unsaturated polymerized olefin-diolefin hydrocarbon resins which comprises treating a solution of previously polymerized unsaturated hydrocarbon resin before quenching and removal of catalyst residues with from 5% to 20% by weight, based on the final total amount of polymerization feed, of a hydrocarbon selected from the class consisting of C_5 to C_6 conjugated diolefins and cyclic diolefin.

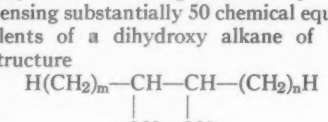
Polyester Resin Compositions

U. S. Patents 2,757,158. Joseph R. Darby and August R. Hempel, Webster Groves, Mo., assignors to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

The process which comprises mixing 100 parts by weight of an unsaturated polyester resin, 10 to 100 parts by weight of a vinyl aromatic compound copolymerizable with said resin, and 15 to 50 parts by weight of a benzyl phthalate of the structure



where R is selected from the group consisting of alkyl radicals and carbalkoxy radicals, admixing with the homogeneous solution so obtained a catalytic amount of a free radical initiator for polymerization, and thereafter curing the mixture, the said unsaturated polyester resin being obtained by condensing substantially 50 chemical equivalents of a dihydroxy alkane of the structure



where *m* and *n* are integers from 0 to 2, inclusive, with 15 to 35 chemical equivalents of an α,β-unsaturated dicarboxylic acid and 35 to 15 chemical equivalents of a phenyl dicarboxylic acid.

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Drying Oils

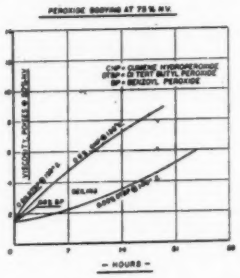
U. S. Patent 2,754,307. August R. Hempel and Paul E. Marling, Dayton, Ohio, assignors to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A drying oil comprising the pentaerythritol ester of an adduct of fumaric acid and a non-conjugated, unsaturated, non-hydroxylated fatty oil having from

10 to 24 carbon atoms in the carbon chains of the fatty acids of the oil, said adduct being obtainable by heating the fatty oil with from 3 per cent to less than 10 per cent by weight of fumaric acid.

Modified Synthetic Drying Oil

U. S. Patent 2,753,385. Anthony H. Gleason, Westfield, N. J., assignor to Esso Research and Engineering Company, a corporation of Delaware.



U. S. PATENT 2,753,385

A process for preparing a drying oil which comprises copolymerizing a mixture of from 75 to 85% of butadiene and 25 to 15% of styrene in 150 to 300 parts of a hydrocarbon diluent per 100 parts of monomers and 10 to 40 parts of an ether chosen from the group consisting of mono and diethers having 4 to 8 carbon atoms and having an O—C—C—O group in the molecule in the presence of 1.2 to 4 parts of finely divided metallic sodium based on monomers at a temperature between 40 and 90° C., continuing the polymerization until substantially 100% conversion is obtained whereby a product is obtained which has a viscosity somewhat less than that ultimately desired, stopping the polymerization by killing and removing the catalyst, and then heating the product at a temperature between 100 and 175° C. in the presence of an organic peroxide until a drying oil having the desired viscosity is obtained.

Stabilized Chlorosulfonated Hydro-Carbon Polymers

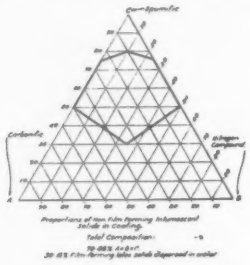
U. S. Patent 2,757,155. Ralph H. Sudekum, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware.

A liquid composition comprising a homogeneous mixture of an uncured halosulfonated polymer of ethylene in an inert organic liquid which is a member of the class consisting of solvents for the polymer and non-solvents for the polymer which are capable of swelling the polymer, compounding agents for curing the polymer, and from 10 to 100 parts for each 100 parts of the polymer of a flocculated metal of the class consisting of aluminum, copper, copper alloys and zinc.

Fire Retardant Coating Composition

U. S. Patent 2,755,260. Elmer K. Stilbert, Jr., Ira James Cummings, and James P. Talley, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Delaware.

An intumescent coating composition comprising a 40 to 60 per cent aqueous dispersion of a mixture consisting of 70 to 85 per cent of non-film-forming intumescent solids and enough of an aqueous film forming latex of a polymer selected from the group consisting of the polymer of vinyl chloride, copolymers of vinyl chloride and other vinyl esters, copolymers of vinylidene chloride and vinyl chloride, copolymers of vinylidene chloride and acrylonitrile, and copolymers of styrene and butadiene to provide correspondingly from 30 to erp15 cent of the polymer solids; based on the total weight of solids present; said intumescent solids consisting essentially of (1) a foam forming ingredient selected from the group consisting of monoammonium phosphate, diammonium phosphate, phosphoric acid, ammonium



U. S. Patent 2, 755, 385

sulfate, sulfamic acid, ammonium sulfamate, ammonium bromide, sodium tungstate, and sodium borate; (2) from 10 to 70 per cent, based on the weight of the foam forming ingredient, of at least one polyhydric compound from the class consisting of starch, the hexitols, the pentitols, and the mono-, and di-tetritols, the amount of any starch employed being less than 15 per cent of the weight of said foam forming ingredient; and (3) from 0 to 55 per cent, based on the weight of the foam forming ingredient, of an amino compound from the group consisting of glycine, urea, dimethyl urea, guanyl urea, guanidine, and dicyandiamide.

Fire Retardant Paint

U. S. Patent 2,754,217. Austin O. Allen, East Orange, Thomas M. Murray, Morris Plains, and Felix P. Liberti, Totowa, N. J., assignors to Vita-Var Corporation, Newark, N. J., a corporation of New Jersey.

A fire-retardant paint effective to form a film having intumescent properties when subjected to heat, comprising pigment, volatile vehicle components and non-volatile vehicle components consisting essentially of at least 10% raw isano oil and at least 5% of a resinous compound selected from the class consisting of polyamide resins and amine formaldehyde resins.

Acrylonitrile-Vinyl Pyridine Copolymer Solutions

U. S. Patent 2,757,154. Ralph Gardner Beaman, Buffalo, N. Y., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

A new composition of matter comprising a copolymer of acrylonitrile and a vinyl pyridine, containing in the polymer molecule 85% to 95% by weight of acrylonitrile and correspondingly 5% to 15% of a vinyl pyridine dissolved in a solvent selected from the group consisting of N-methyl-N-ethylacetamide, N,N-dimethylpropionamide and N-acetyl piperidine.

PROBLEMS IN FINISHING AUTOS

(*From page 34*)

Table V

CYCLE TESTS FOR CRACKING

Humidity room 100% R.H.	— 100°F.	24 Hr.
Cold room	OF— −10°F.	20 Hr.
Room temperature		4 Hr.

Short Cycle

Humidity	16 Hr.
Cold	6 Hr.
Room	2 Hr.

The same two topcoat bakes of 20 min. at 60° F and 30 min. at 200° F are used. Gravelometer, humidity and cracking tests are run before and after a three month exposure in Florida. Since moisture accelerates lacquer chalking, we have what we term a cold box available for the development of moisture on panels. This is simply an insulated box containing refrigerating coils and a small circulating fan. The test panels from the closure of a side facing 45° south. Under humid conditions without sunshine, dew forms on the panels. For accelerated tests in the laboratory we have designed a light-dew tester which we call "Little Florida". It duplicates the effect of the cold box, but can not replace actual Florida exposure.

By following these test procedures carefully, we hope to insure a long lasting and highly satisfactory finish for the cars of the future.

TECHNICAL Bulletins

AEC RESEARCH REPORTS

Atomic Energy Commission research reports released through the Office of Technical Services, U. S. Dept. of Commerce, Washington, D.C., are now available in eight category "packages." This service has been established to meet the demand by scientific and industrial organizations for a bulk purchasing arrangement.

Each "package" contains all AEC reports in its category available through OTS in full-size, printed copies, as of May 21, 1956. Subject categories and prices are: Health, Physics, Biology and Medicine (220 reports), $74.00; Chemistry (455 reports), $164.00; Engineering (105 reports), $34.00; Geology and Mineralogy (144 reports), $42.00; Instruments (292 reports), $62.00; Metallurgy and Ceramics (380 reports), $92.00; Physics (1190 reports), $280.00; Miscellaneous (55 reports), $23.00.

Newly released AEC reports are announced monthly in the OTS-published U. *S. Government Research Reports*, which also lists reports available to the public covering research by other government agencies ($6 a year from the Superintendent of Documents, U. S. Government Printing Office, Washington 25). Reprints of the monthly AEC list from this publication may be ordered at 10 cents each from OTS.

CHEMICAL ABSTRACTS

"Chemical Market Abstracts" is a monthly 150-page leatherette-bound report of marketing news. Each issue is an easy-to-use compilation of 2,000 abstracts of market information on chemicals, chemical products, chemical producers, and chemical-consuming industries. Each issue contains a "Chemical Section," an "Industry Section," and a "Company Section." Subscription rates are available from Chemical Market Abstracts, Dept. PVP, 29 W. 15 St.. New York 11, N. Y.

CORRUGATED BOXES

Nine basic rules for efficient stacking and loading are discussed in a new edition of "How To Stack and Load Corrugated Shipping Boxes," a 16-page booklet published by Hinde & Dauch, Dept. PVP, Sandusky, Ohio.

New copy and detailed illustrations describe effective methods of estimating storage space, distributing load weights, handling, identification, and the use of gates, bulkheads, barricades and weather-stripping.

PHOSPHONITRILIC CHLORIDE

Millmaster Chemical Corp., Dept. PVP, 295 Madison Ave., New York 17, N. Y., has published a technical data sheet giving the properties and uses of Phosphonitrilic Chloride, $(PNCL_2)n$, which it is now making available in pilot plant quantities.

Phosphonitrilic Chloride comes in two grades, refined and technical. Among its suggested uses are as a coating and binder for glass, and as an intermediate for polymers.

EXPLOSION-PROOF MOTORS

General Electric Co., Dept. PVP, Schenectady 5, N. Y., has issued an eight-page bulletin, GEA-6341, on its "Tri-Clad 55" explosion-proof motors for hazardous locations, one through 30 horsepower. The illustrated, color bulletin discusses design features and maintenance of these new induction motors.

GLOSS, COLOR RECORDER

Bulletin No. 167 describes the new Gardner automatic gloss, color and reflectance recorder which utilizes a modified Varian Model G-10 graphic recording unit. Available from Gardner Laboratory, Inc., Dept. PVP, Bethesda 14, Md., the bulletin discusses the unit's applicability, equipment required, optional equipment, operation, high-speed balancing motor, and easy adjustments.

PVA IN PAINTS

A 16-page brochure, "Vinyl Copolymer Paints and Sealers. . .With National's 12K Series of Resyns," has been published by the Resin Division, National Starch Products Inc., Dept. PVP, 270 Madison Ave., New York 16, N. Y. Included in the brochure are two cover pockets—one on the inside of the first cover, the other on the inside of the second cover—containing a number of suggested exterior and interior formulations, as well as primer sealer formulations.

PIGMENT DISPERSIONS

Pennsylvania Color & Chemical Co., Dept. PVP, Pine Run Rd., Doylestown, Pa., has published a four-page technical data bulletin on pigment dispersions presenting formulation data in 16 different product classifications covering the firm's line of pastes and chips in various vehicles. Also covered are universal tinting bases, colorants for plastics, and products for transparent coatings. A concluding section presents hints for mixing, and helpful general information.

POLYMERIZED FATTY ACID

A new 20-page booklet titled "Empol 1022 Polymerized Fatty Acid" has been published by the Organic Chemical Sales Dept., Emery Industries, Inc., Dept. PVP, Carew Tower, Cincinnati 2, Ohio.

In addition to a complete description, specifications, characteristics and shipping data on "Empol 1022" the booklet contains considerable application data in many fields. These are exemplified by adhesives, films, foams, lubricants, elastomers and surface coatings. A complete end-use bibliography completes the material presented.

WIRE CLOTH

The second issue of "Multi-Matter," a 4-page newsfolder, has been issued by Multi-Metal Wire Cloth Co., Inc., Dept. PVP, 1355 Garrison Ave., New York 59, N. Y. Among the stories in this issue are "Wire Cloth Helps Filter Press Users"; Metallic Filter Cloth Blankets Cut Filter Cloth Costs"; "Plastic Filter Leaves Solve Corrosion Problem"; "Test Filter for Experimental Work"; "Multi-metal Develops New 'Rim-Lok' Filter Leaf," and "On Particle Retentivity of Metallic Filter Cloths." Also included is a list of literature available from the company.

EPOXY RESINS

Varnishes based on the company's epoxy resins are discussed in a booklet that lists types and formulations. Booklet is available from Synthese N.V., Dept. PVP, Katwijk aan Zee, Holland.

FATTY ACIDS and ESTERS

A new brochure giving the details of specifications and characteristics of its coconut oil fatty acids, methyl esters and specialty products has been released by the El Dorado Division of Foremost Food and Chemical Co., Dept. PVP, P.O. Box 599, Oakland 4, Cal.

FLUOROCARBON PRODUCTS

The forms, properties and uses of a wide range of fluorocarbon products—from plastic resins to acids and dielectric fluids—are described in a new 8-page brochure published by the Chemical Manufacturing Division, The M. W. Kellogg Co., Dept. PVP, P.O. Box 469, Jersey City, N. J.

Developed to meet the most exacting operating requirements, corrosive and humid atmospheres and high or low temperatures, Kel-F fluorocarbon products now consist of molding and extrusion plastics, dispersions and coating resins, a fluorocarbon rubber series, oils, waxes and greases, printing inks, acids and alkanes. According to the brochure these materials are characterized by extreme chemical inertness, thermal stability, high impact and compressive strength, low cold flow, dimensional stability, zero moisture absorption, and high dielectric strength. Detailed in the booklet are the types and grades available of each form of Kel-F fluorocarbon products and their suggested uses.

PLASTICIZER

A booklet describing "Plasticizer 84," a distilled butyl octyl phthalate plasticizer said to show excellent promise as a replacement for dibutyl phthalate in nitrocellulose lacquers, lists the product's compatibility with various type resins, and shows where it might be acceptable in various military specifications.

According to the booklet, "Plasticizer 84" is comparable to dibutyl phthalate in nitrocellulose lacquers in most respects and in two important properties, cold check resistance and permanence, laboratory tests described in the booklet show it to be superior. Available from Eastman Chemical Products, Inc., Dept. PVP, Kingsport, Tenn.

PRODUCTION FACILITIES

Troy Engine & Machine Co., Dept. PVP, 650 Railroad Ave., Troy, Pa., has issued a folder on its production facilities available for contract work. Listed and discussed are its foundry facilities (both iron and non-ferrous); metal working; tool room facilities; electrical department; metal fabrication and assembly, and final inspection.

DRAFTING PRACTICES

"Standard and Simplified Drafting Practices" has been published by American Machine & Foundry Co., Dept. PVP, 261 Madison Ave., New York 16, N. Y. Included in the booklet is a paper delivered by Jay H. Bergen, Standards Administrator, American Machine & Foundry Co., before the American Society for Engineering Education, at the Illinois Institute of Technology, Chicago, last January.

PVAc

Properties and characteristics of "Gelva" polyvinyl acetate emulsions for use in paints are described in a new 18-page technical booklet published by Shawinigan Resins Corp., Dept. PVP, Springfield 2, Mass.

Major emphasis in the booklet has been placed on techniques for formulating paints based on "Gelva" emulsions and on the physical properties of both the finished paint and the base material.

A special section has been devoted to suggested paint formulations for exterior, interior and primer sealer applications. A section on the packing, storage and handling of these emulsions also is included.

DOUBLE PADDLE MIXERS

A complete line of double paddle change can mixers is described in a new bulletin, providing operating feature information, illustrations and specifications.

The bulletin, issued by The Cincinnati Hildebrand Co., Dept. PVP, 3410 E. Beekman St., Cincinnati 23, Ohio, illustrates both tilting head and vertical raising head models, and provides specifications for both types of units, in sizes ranging from eight to 150 gallon working capacities. Featured operating device is the self-adjusting "Floating Scraper," said to be actually guided by the mixing can to provide thorough cleaning of even out-of-round cans.

CHEMICAL MIXING

A new Addendum No. 1 to Technical Supplement HM on the use of the "American" Homomix in continuous chemical mixing without a mixing tank has been published by The American Well Works, Dept. PVP, 126 N. Broadway, Aurora, Ill.

This technical supplement addendum discusses the general theory of mixing, viscosity and fluid classes, continuous mixing vs. batch mixing, and the advantages of continuous mixing, with a table of comparison between "American" Homomix and other pipeline mixers. It explains the operation of the Homomix as a continuous pipeline mixer and as a batch mixer, gives features and design data, including curves on size and capacity.

CHEMICAL PROCESSES

The basic design considerations of five major chemical processes are featured in a new brochure published by the Process Plants Division of Industrial Process Engineers, Dept. PVP, 8 Lister Ave., Newark, N. J. Plants for the manufacture of alkyd resins, fattv alcohols, phenolic resins and maleic anhydride, and for fatty acid hydrogenation are described, with particular attention given to those variables and factors which are the most critical to efficient and economical operation. Typical flow sheets, piping layouts, equipment designs and installations are illustrated. The brochure also depicts the complete engineering service that the company offers to industry.

INDUSTRIAL CHEMICALS

A new 20-page booklet describing briefly the complete line of company chemicals for industry has been issued by the Industrial Chemicals Division, Olin Mathieson Chemical Corp., Dept. PVP, 460 Park Ave., New York 22, N. Y. The new booklet covers the company's organic, inorganic and specialty chemicals, listing characteristics, grades, containers and producing points for each. Principal uses are given for organic chemicals and specialties.

FORK TRUCKS

Construction details, operating characteristics and maintenance features of the new Clarklift line of fork trucks are described in a 16-page, three-color brochure, titled "Clarklift Features," available from the Industrial Truck Division, Clark Equipment Co., Dept. PVP, Battle Creek, Mich.

Numerous photographs and simplified drawings help explain many of the engineering features of the six-model line. A special section on the new Hydratork Drive describes the operation and interchangeability features of the power train.

The Clarklift's two separate braking systems are illustrated and described, as are a number of safety and comfort features. Accessibility characteristics are detailed, and a series of action photos shows how the Clarklift can be prepared for major servicing in a few minutes. Included is a list of 34 major components which are interchangeable on all models in the line.

ADVERTISERS' INDEX

WITH THE PROS, ONE IS NOT ENOUGH . . .

so Cyanamid offers you four CYMEL* *Resins to give you the right baked finish!*

Different coating applications call for different combinations of properties. To help you get the right balance in your formulations, Cyanamid offers not one, but *four* outstanding CYMEL* Resins for coating enamels. All offer the superior gloss, durability, scratch resistance, color retention and stability of melamine resins. And each offers its own special extras:

CYMEL Resin 245-8—*fast curing*, versatile resin for automotive and appliance finishes. Best color retention at above-normal temperatures in stove parts and lamp housings. Improves solvent, chemical and mar resistance in baking finishes.

CYMEL Resin 248-8—*exceptionally fast curing* to permit shorter baking schedules or lower baking temperatures. Tops in hardness and chemical resistance for superior appliance finishes and automotive enamels.

CYMEL Resin 247-10 – superior compatibility with medium oil alkyds and high hydrocarbon solvents for use in enamels requiring amino resin with mineral spirits tolerance. Well suited for roller coating applications requiring very smooth finish.

CYMEL Resin 243-3 – contains no butanol, is cut completely in petroleum aromatic solvents, offering very mild odor. Even wider range of compatibility with short, medium and long oil alkyds, polymerized oils and many oleoresinous varnishes. Ideal for alkyd-amino formulations applied by roller, dip or spray, and as thermosetting fortifier for oils and varnishes.

Write for technical data reports on these and other Cyanamid resins—they come punched and ready for filing.

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How HYDRITE Kaolinites affect GLOSS

in Butadiene-Styrene Copolymer Latex Paints

During the past few years HYDRITE Kaolinites have become the most important pigment extenders used in water-based paints. This is due to the unique combination of desirable properties they exhibit during paint production and use.

These valuable properties spring from the fact that, as HYDRITE particles change in *size*, they also change in *shape*. Finer than 2 microns they occur as hexagonal lamellar plates—coarser, they appear as stacks of these plates firmly cemented together (see graph below).

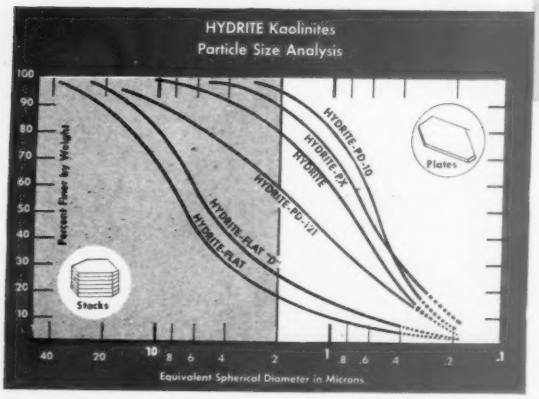
The effects of particle size distribution on gloss of a butadiene-styrene copolymer latex paint are clearly shown in the graph at right.

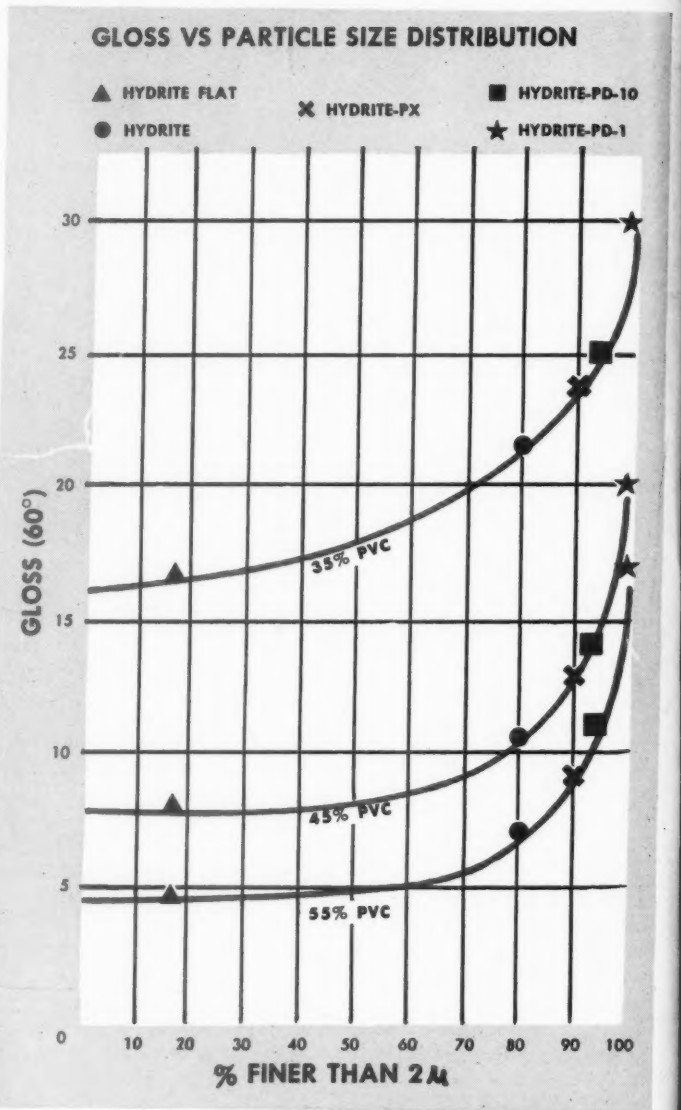
This graph is based on 3 experimental formulas at 35, 45 and 55% PVC, using HYDRITE Kaolinites ranging in particle size from 4 to 100% finer than 2 microns. The amount of prime hiding pigments used in these formulas was held constant, only the kaolinite content being varied to effect the differences in PVC.

The pronounced effect of kaolinite particle size on gloss can readily be seen from the graph. Note especially the magnitude of this effect as the plate content of the kaolinite used exceeds 80%.

This graph indicates the possibilities of using HYDRITE Kaolinites as aids in controlling gloss in butadiene-styrene copolymer latex paints. Further details are given in our Technical Service Bulletin TSBH-11.

Send for it.





GEORGIA KAOLIN COMPANY

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